

TRANSPORTATION LEADER
FEBRUARY 8, 1941

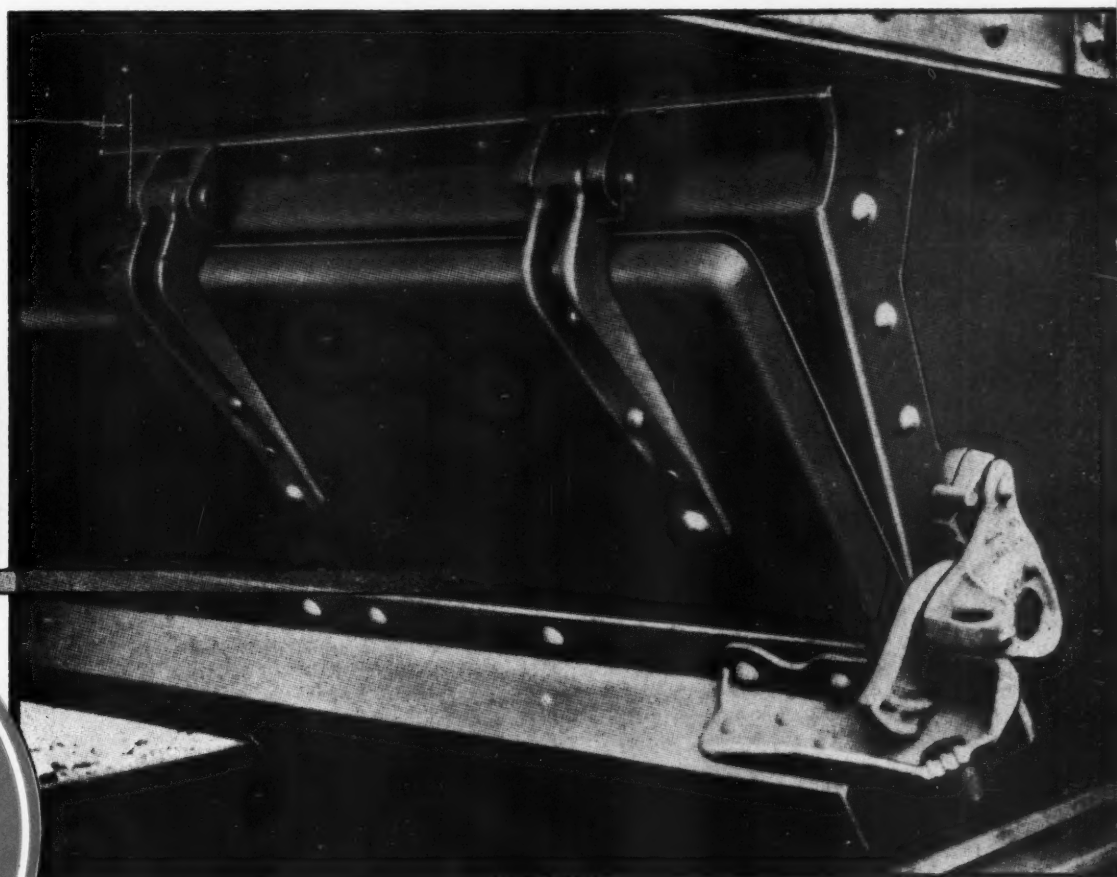
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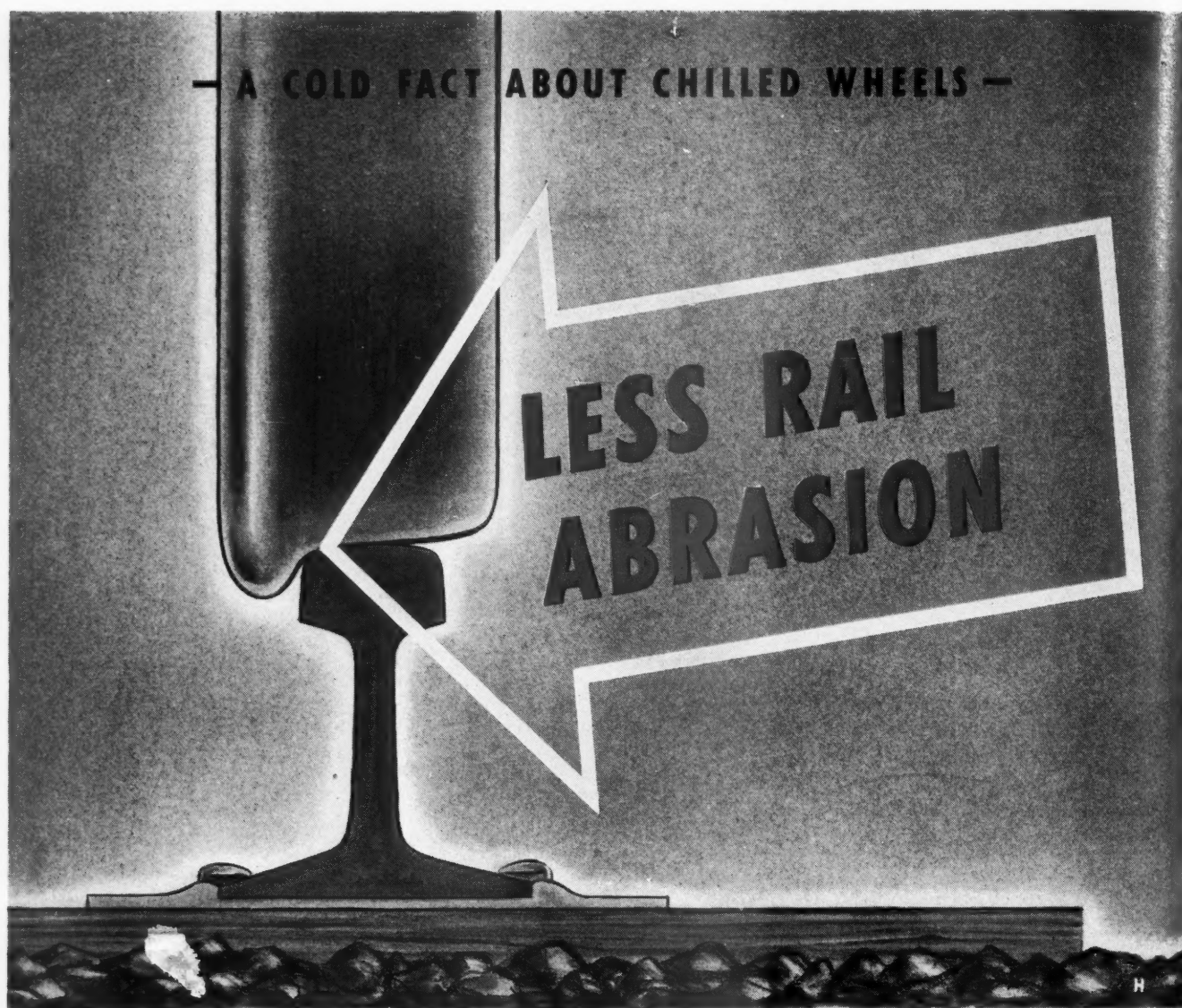


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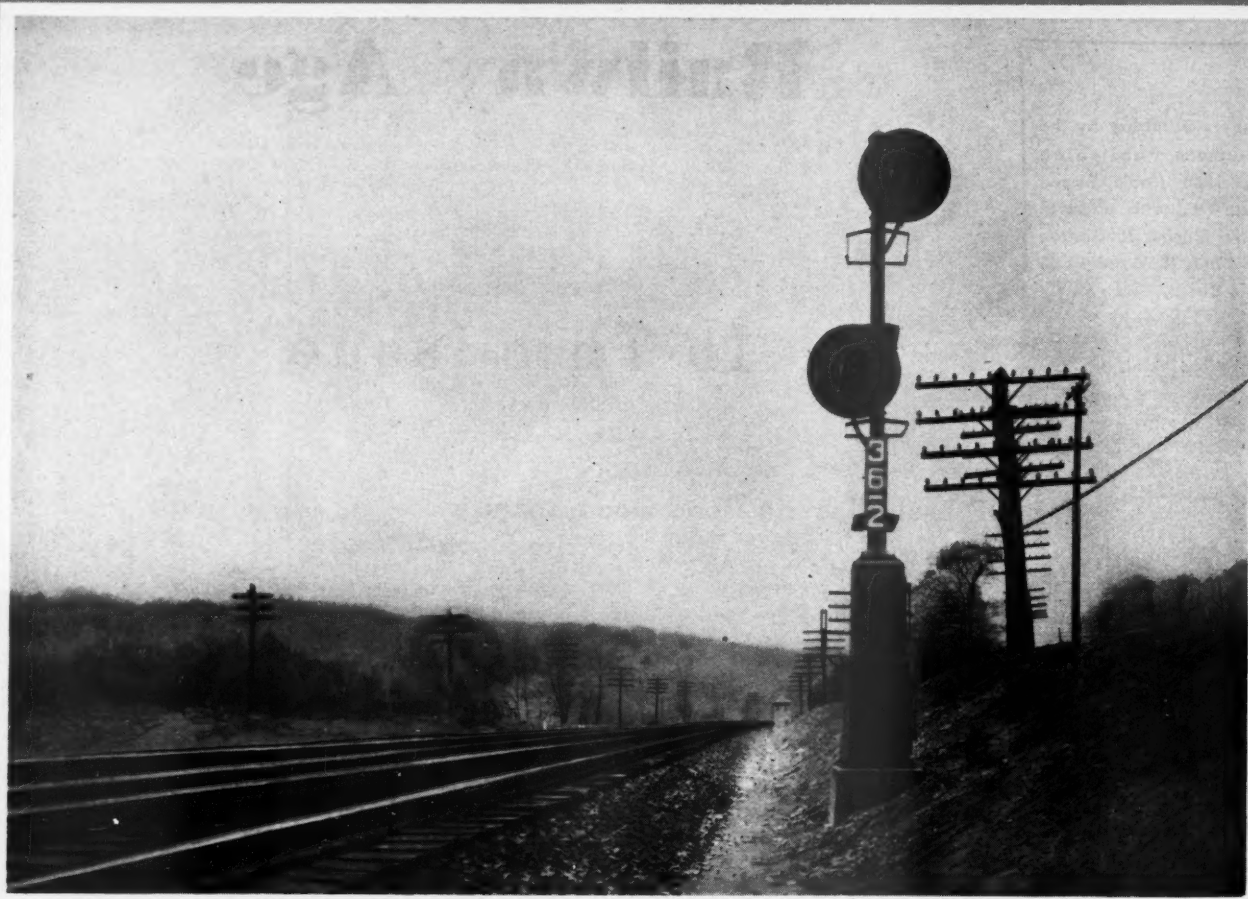
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The Week at a Glance

FALSE PHILOSOPHY: The leading editorial herein suggests that railroad men falling for Communism may not indicate gullibility on their part so much as it proves the failure of friends of free enterprise to publicize their philosophy in terms which the common man can understand. The philosophical background of free enterprise rests on ordinary horse sense—and it is inconceivable that any man not a hopeless dummy could think this philosophy through and then be willing to abandon it for such fol-de-rol as is used to justify Communism. Since there are a certain number of psychopaths and incompetents in every society, the existence of Communism is not hard to understand—but its ability to win converts (even if only temporary ones) outside the homes for the not-right-bright indicates that the friends of free enterprise have done a mighty feeble job of merchandising their philosophy; and of putting it into bread-and-butter language.

R. I. DIESELS: The Diesel-electric locomotives being used by the Rock Island on the new "Arizona Limited" are described in an illustrated article herein. The motors are rated at 2,000 hp. and are designed for a maximum speed of 120 m. p. h.

CROSSINGS ON S. I., N. Y.: Grade crossing elimination in suburban service on Staten Island, N. Y., is described and illustrated in an article herein—the conditions overcome being complex (as usually happens where congestion is a factor). Not only crossing structures, but new stations, too, were involved; and the engineers had also to contend with "muck holes" and excessive ground water.

HARRINGTON CLAUSE: Railroad managements and unions are in disagreement over the proper interpretation of the so-called "Harrington amendment," written into the 1940 Transportation Act; and they have, in effect, asked the I. C. C. to decide between them. Some, for one thing, contend that the new clause in the law supersedes the so-called Washington Agreement (protecting jobs in mergers); but others say not. The case which brings this issue before the Commission is the lease of the F. W. & D. C. by the C. & S.

CARTER CURSE ON Q: A. G. Carter, Ft. Worth publisher and valiant defender of his city's prestige, appeared in opposition to the C. & S. leasing of the F. W. & D. C. (which Texans fear may cost the state some railroad population) and said that, in his will, he has admonished his son to continue reprisals against the Burlington, if it removes its offices from Texas. Other Texas witnesses threatened vengeance against the railroads in general, and the Burlington in particular, if the move is made—including lifting of the load limit on trucks and the diversion of traffic to competitors. These citizens seemed

not too aware of the obligation of the railroads to supply the country with economical transportation; and of their financial inability to function primarily as an agency to promote local employment. No other business not supported by tax money assumes such an obligation.

1940 NET EARNINGS: Net railway operating income in 1940 has been reported at 682 million dollars—which, incidentally, exceeds by 12 million dollars the estimate placed by this paper in our January 4 (Annual Review) issue on these revenues. As a matter of fact, the 1940 net railway operating income is within 3 per cent of the prediction we made regarding it at the end of 1939—a coincidence for which we claim no particular credit. There is so much politics and war in the picture now that estimates and predictions have to be made on conditions which may change overnight—and if situations the predictor foresees are kind enough to persist in such manner as to support his predictions then he is fortunate.

WHY COMMUNISM?: Beginning with the report that a few railroad employees in the mid-West have embraced Communism, the leading editorial in this issue proceeds to examine, from the figures, what the effect of Communism would be upon railroad employees. Even with the present national income, communization would impoverish the average railroad employee. But, more than that, Communism or any form of socialism, transfers leadership of production from men experienced in it and gives control to politicians. So there is less to divide than there was before. And that is why a man on relief in America lives better than a fully-employed artisan in Russia.

SLICHTER ON UNION POLICY: When Dr. Sumner Slichter offers constructive criticism of labor union policies, his observations cannot be dismissed with the contention that he is a propagandist for employers; because everybody, including leaders of organized labor, know that he is not. Well, Dr. Slichter has taken a good look at labor union conditions in this country (including those on the railroads) and has found lots of room for improvement. His remarkable survey is reviewed in some detail in these pages—and his conclusions on "make work" rules; the dual basis of pay in train service; and the Adjustment Board situation will bear some thought.

FREIGHT DIESEL: As reported and pictured in a short article herein, the Santa Fe on February 4 inaugurated the first heavy-duty, main-line Diesel-electric freight operation in the country. The power unit develops 5,400 hp. Viewed by traffic clubs in the Chicago area on February 3, the new locomotive began its initial run coastward, with a press party aboard, on the following day.

SCRAP PRICES: A couple of large railroads, as is related in the news pages herein, have notified scrap dealers that they will refuse to consider bids which are in excess of the prices designated as maximum by the National Defense Advisory Council. As the account goes on to reveal, opinion among the railroads on this action is not unanimous; and some confusion seems to exist generally in the scrap market.

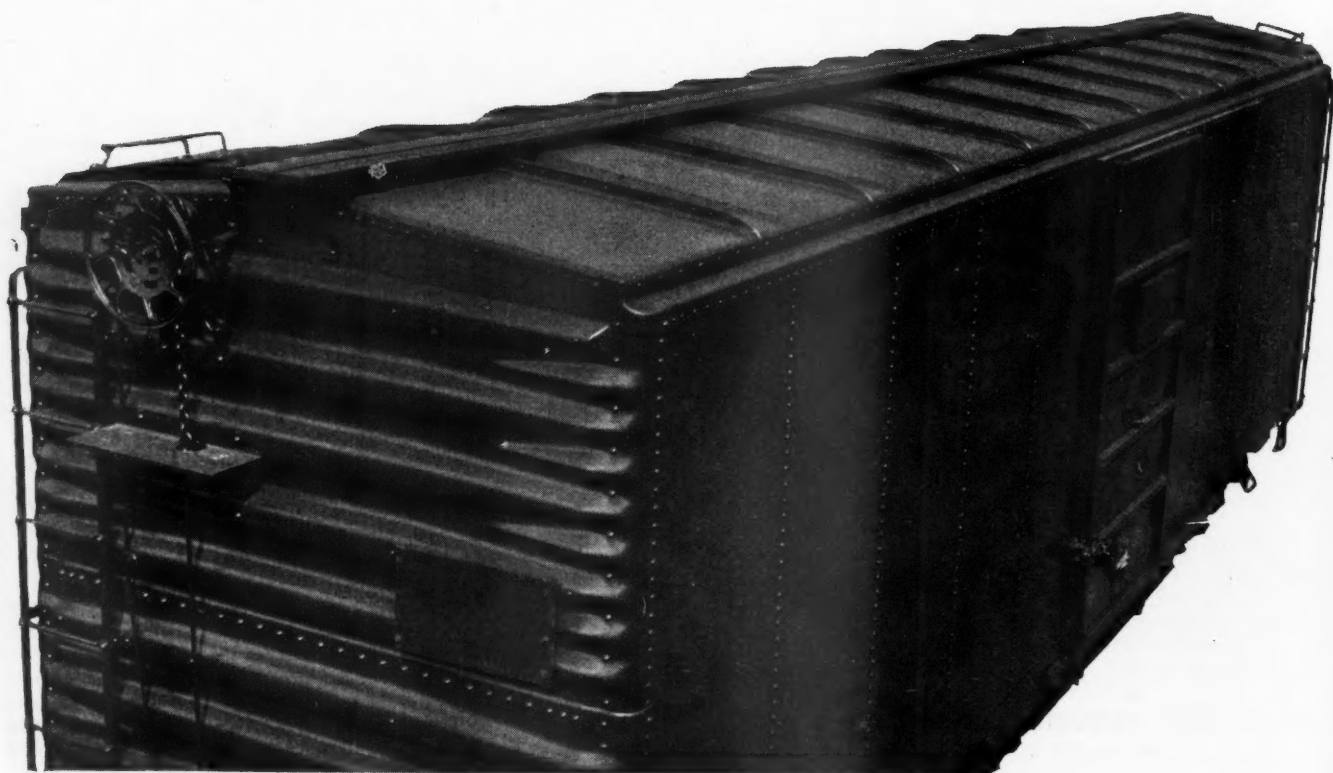
DECENTRALIZED GOV'T?: Law-giver Dirksen of Illinois would "decentralize" the Railroad Retirement Board out of Washington into some nice mid-western spot like Chicago or Kansas City. At first glance, this scattering of the federal government looks like a good idea—maybe their lordships would have more frequent lucid moments if they were to mingle more with the people who put up the money. On the other hand, such farming out of the civil servants might give each congressional district another "house industry" to be lobbied for like turning the local creek into a canal. It would be handy, too, for some of the bureaus, if they lived closer to the well springs of their inspiration. For example, the Federal Barge Line has moved its seat to the capital city of the Mississippi Valley Association. Nominations for appropriate locations for various government bureaus and officials will suggest themselves upon a little reflection. For example, what city would make an appropriate and convenient headquarters for the "trade barriers" division of the Department of Commerce?

EQUIPMENT ORDERS: In January the railroads ordered more locomotives than in that month of any year since 1930. Freight car orders, meantime, were greater than those of any January since 1929—excepting only 1937. In the past eight months approximately 70,000 freight cars have been ordered. January was also a good month for passenger equipment—thanks largely to the large-scale purchases of the New York Central.

THE CROWDED DOGHOUSE: Business men who in times past, and even present, have been active in fostering (or doing nothing to prevent) ham-stringing regulation of the railroads may read the Supreme Court decision on the wages and hours act, and contemplate what, quite likely, is in store for them. There is now, apparently, no limit to the pushing around which Congress can give to any business which has any interstate aspect to it; and precedents have been set for such legislation by acts long on the statute books dealing with the railroads, many of which business men helped to put there. The encouraging aspect of the situation, if there is one, is that business men may henceforth take greater interest in the kind of men who go to Congress; and they may be less indifferent than they have been to schooling themselves and others in the principles of free enterprise.

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RAILWAY AGE

Why Should a Railroad Employee Turn Communist?

We have heard recently that a number of employees of a mid-western railroad have become converts to Communism, and are trying to proselytize their fellow employees. We have too much confidence in the common sense of most railroad men to become much alarmed over this report. Nevertheless, the development will bear watching; and some contemplation too. One of the employees most active in this subversive effort is a locomotive engineer, and not a particularly dumb fellow either. A sales technique of a very high order must be in operation by the Communists to enable them to enlist a person, so obviously of the "bourgeois" or middle class, in a "proletarian" movement which has as its aim the destruction of the middle class. Or maybe the Communism of this engineer is ascribable less to the sales skill of the Reds than it is to the almost complete absence of any educational effort in behalf of the traditional American system of free enterprise.

What Would Wages Be Under Communism?

Be that as it may, there can hardly be a finer example of a man sawing off the limb on which he is sitting than that of a locomotive engineer turned Communist. The ultimate aim of Communism is a leveling out of incomes. In 1939, (we use that year because strictly comparable figures are not yet available for 1940), the average compensation of a through-freight engineer was \$3,147. In the same year, the average compensation of all railroad employees was \$1,887. In 1939 the railroads earned \$588,000,000 for their bondholders and stockholders.

Suppose that the carriers were communized; that all railway wages were equalized; and that all the income available for security-owners in 1939 had been divided evenly among all employees. The result of such communization of railway income would have been to make the average annual wage per railroad employee \$2,465—which was \$682 less than the average through-freight engineer actually received in 1939. Communization of the railroads, therefore, would leave the average freight engineer almost 22 per cent worse off as to income than his present status—and that is interpreting the figures entirely to the employees' benefit. As a matter of fact, if the railroads were govern-

ment-owned and \$588,000,000 were earned over and above expenses, is it likely that the politicians running the government would divide that money up among railroad employees? Experience does not so teach.

But these figures assume the communization of the railroads only. What would happen to the average railroad engineer, and to the average railroad employee, under the general communization of industry? The claim is that, under Communism, charges for dividends and interest are wiped out. We shall demonstrate later on in this discussion that this contention is false—but let's grant for the time being, and just for the sake of the argument, that communization does wipe out all payments for the use of capital. What effect would that have on the average income of the working man; and in particular upon the earnings of railroad employees and of railroad engineers?

In 1939 total national income payments were approximately 70 billion dollars, and of this amount about 9 billion dollars went into dividends and interest. Since there were approximately 45 million people gainfully employed in 1939, the above figures indicate that the average employed person received \$1,355 (and this includes professional incomes as well as wages). If industry were communized and payments of interest and dividends were wiped out, the division of the total national income of 70 billion dollars equally would give all employed people \$1,555 each. But this would be \$332 less than the **average** railroad employee received in 1939, and it would be less than half the \$3,147 received by the typical through-freight engineer.

Politicians in Charge of Production

General communization of income, plainly, on the very best construction that can be put on the figures, would leave the average railroad employee holding the bag for upwards of \$300; and it would cut the wages of the average engineer in two. But this isn't the worst of it—not by any means. The above figures all assume that the amount of the national income available to divide under Communism would be as great as it is now. If Russia is any criterion, this is certainly exactly what would **not** take place. The first characteristic of free enterprise is that it places a premium on productive ability. That is to say—it chooses its

leaders competitively from among those who show the most ability at producing. Communism, or any other form of political control of industrial activity, doesn't choose its leaders for their productive ability. Instead, the fellows who get at the helm of production under **any** form of socialism are the ones who are skilled in politics. Is there anybody so naive as to think that politicians could take over the productive facilities of this or any other nation, and make them turn out more income for the people than they can be made to produce by supervisors and managers who get and hold their jobs only by showing their ability to produce?

To ask that question is to answer it. Even at the present level of production, communization of the railroads would be ruinous to labor—not only to the higher-paid railroad employees, but to average employees also. And if politically-managed industries in other countries, including Russia, are any criterion, the kind of political management of industry which we too would have under Communism would probably greatly reduce the total national income—so that even the lowest paid employee of any industry in the country would find himself far worse off than he is now.

Moreover, the claim of the Communists that they avoid paying interest and dividends is not true. Interest and dividends (usually misnamed "profits") are the price which nature requires people to pay if they want to have tools and machinery with which to make their work more productive. In America we do not force people to save (or, at any rate, we didn't do so until the New Deal came along). We don't (or, rather, didn't) force anybody to pay interest or dividends either. Our traditional method was to let the man save who wanted to do so, and to let him rent out his savings to people who wanted them for buying tools and machinery at any price the bargainners could agree upon.

Communism Does Not Avoid Paying for Capital

The Russian method is to force the present generation to go without necessities of life (i. e., forced saving) so that there may be an accumulation of machinery and plant out of which dividends and interest, in the form of higher wages, may be paid to future generations (if the politicians don't get them first). Communization may **seem** to benefit industrial workers at first, because it starts off with the initial advantage of the property confiscated from private investors. But once this property wears out, it can be replaced only by forcing people to abstain from present consumption to promote future production (i. e., the "five-year plan"). Under free enterprise the abstaining from present consumption is done by people who want to do it and who are induced to do so by the prospect of interest or dividends—under Communism everybody (except, possibly, the politicians) abstains. People don't get something for nothing away from Dame Nature under Communism any more than they do

under free enterprise; and the pretense that they do, and thus that Communists have something to offer to the working man, is pure fabrication. All Communism really offers the people is the loss of their freedom, with politicians instead of producers at the head of production.

With the facts being what they are, one's first impression is that a railroad employee—and particularly one in the higher brackets—who has embraced a doctrine which, if successful, would reduce him to comparative poverty, must be pretty much of a dope. But a little reflection shows that this is not necessarily the case. Just where, for instance, would a railroad employee likely get hold of some of the more important economic facts of life, such as those outlined in the above? Unless he feels ambitious enough to spend \$6 for a subscription to *Railway Age*, or unless he has sufficient intellectual curiosity to while away his spare hours reading economics in the public library, the chances are in most parts of the country that he is going almost completely uninformed of the basic facts which underlie his income and his job. On some few railroads, to be sure, a rather systematic effort is being made to get such facts before employees—but the effort in this direction is thus far considerably short of the need. The harvest is large but the laborers are few. By contrast, Communist tracts are a dime a dozen; and they are written in language that the common man can understand.

Employee Education—Whose Responsibility?

We do not in this connection wish to offer blanket criticism of anybody—certainly not of the railway union press. Some of those journals are excellently edited and, as far as they go, are admirable publications. And yet none of them with which we are familiar gives regularly the basic facts which would equip its readers to form intelligent judgments regarding many public questions—and matters of union policy—which the individual members of these organizations are called upon to decide. For example, we read in some of these publications propaganda in favor of government ownership of electric power and for consumers' co-operatives and other such socialistic or semi-socialistic ventures. But such enterprises, really, are of very little importance in maintaining or advancing the economic status of railroad employees. Instead it is private investment and private enterprise which have made America the nation of the highest standard of living in the world. The leaders of the railway labor organizations would be doing a useful service for their members if they should give them more information of the economic facts which go to sustain railroad employment, and the present favorable level of railroad wages—so that their members might avoid unwittingly favoring policies which would jeopardize their favorable position.

In presenting such information, it would be well,

also, to emphasize the fact that there is no difference whatsoever between the objective of Communism and that of other varieties of socialism. In both cases, that objective is government ownership and management of all property. The only difference between these two philosophies lies in the method by which they propose to attain this objective. Nor is a discussion of Communism and socialism a mere academic matter; the movement toward these theories of government is the principal cause of the strife in the world today; and the movement is daily becoming more and more manifest in the United States. It must follow, inevitably, one of three courses: it may prevail through peaceful means; it may resolve into a class struggle with an unpredictable outcome; or it may be met and

* For example, see the editorial "What Every Railroader Ought to Know About Free Enterprise" in our December 7, 1940, issue—reprints of which, incidentally, we shall be glad to supply at their actual cost price to us.

defeated by a campaign of education which will point out in no uncertain terms just what nationalization of their industries will mean to the American people.

Free Enterprise Failing to State Its Case

In making the above observation, we are not trying to pass the responsibility off on the unions. It certainly is not theirs alone. It is railway managements' too. It is also ours. We have been exerting ourselves to the utmost of our ability in this direction* and, all the time, we are getting more and more company. But still not enough. It is a shame that even one of the million men who work for the railroads should be enticed into Communism, simply (as we suspect) because that is the only coherent and plausible economic philosophy which anyone ever took the trouble to explain to him.

Division 5 and Motor Carrier Rates

At the beginning of motor carrier regulation, Division 5 of the Interstate Commerce Commission, at the request of certain motor carrier rate bureaus, instituted Ex Parte proceedings in MC 20, 21, 22 and 23 and entered orders therein, establishing minimum reasonable rates for motor transportation in practically all the territory roughly described as being East of the Rocky Mountains and North of the Mason and Dixon Line. The Division believed, at that time, that an emergency existed in the motor carrier industry.

No sound test was used in prescribing this vast body of rates, largely copied (excepting New England) from railroad tariffs, as minimum reasonable rates. They varied more than 100 percent in a given area, and more than 250 per cent as between various areas, for substantially the same service, without sound justification. Besides, an entirely different pattern was used in New England to determine minimum reasonable rates. Literally hundreds of these rates would not meet the test of minimum reasonableness prescribed in more recently decided individual cases in the same area. The justification of "emergency" would now appear to be questioned by Chairman Eastman in his dissent in MC 20, 24 MCC 501.

Additionally, the administration of the law has been materially changed by the Transportation Act of 1940. It is now provided that:

"The assignment or reference, to the divisions, of work, business, or functions relating to the lawfulness of rates, fares, or charges shall be made according to the character of regulation to be exercised and not according to the kind or class of carriers involved or to the form or mode of transportation in which such carriers may be engaged."

Even before this new law was enacted, the Commission felt the necessity for reorganization to administer the law along functional lines and it is to be presumed that this reorganization meets the requirements of the new law.

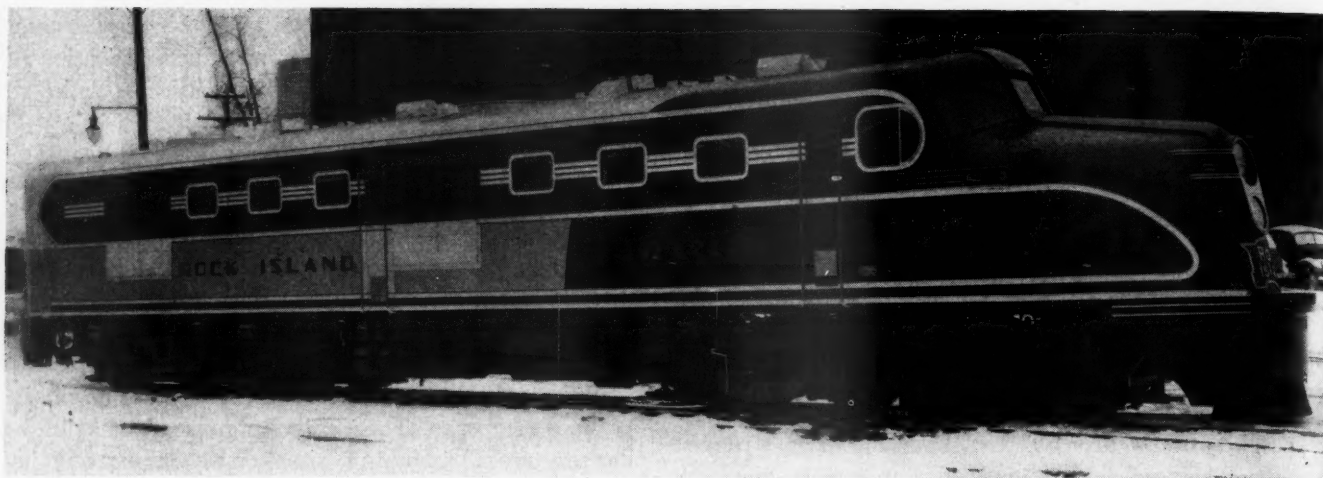
In view of this reorganization and the jurisdictional change in the law which gave it the effect of statute, there seems to be at least a reasonable doubt

whether Division 5, which was originally organized only to consider motor carrier rates, can now lawfully consider the unending petitions that are being filed for the revision of the minimum rate orders in these proceedings or to enter any further orders therein. Chairman Eastman has questioned the necessity or desirability of even maintaining the orders that have previously been entered.

The Commission, as has repeatedly been pointed out by eminent authorities (and it may rightfully take pride in the fact) is the outstanding administrative agency of the federal Government—which has usually tried to give due regard to the law and to respect its Constitutional limitations in reaching its conclusions and entering its orders. Because of this attitude on the part of the Commission, it has gained the respect of all who are acquainted with its proceedings. But can the conditions now existing be expected further to enhance its reputation?

Machinery has been set up by the I. C. C. reorganization in accordance with the new law and is now functioning effectively to prevent destructive rates in all branches of the transportation industry; no useful end is served for Division 5 to continue in this capacity. Besides bringing the reorganization to a more efficient basis, and the apparent desirability of vacating these previous orders that are now certainly questionable, there would appear now to be serious question whether Division 5 can lawfully enter orders in motor carrier rate cases regardless of when the proceedings were originally instituted.

Because of this question of the validity of existing orders in these proceedings, the lack of present necessity for their continuance, and the further fact that a new division has been created, and functioning efficiently, would not the sound procedure be for the Commission voluntarily to vacate all of its orders in the above-referred-to Ex Parte proceedings—and begin to make full and better use of the new machinery that has been provided in accordance with the new law?



Diesel-Electric Road Locomotives For the Rock Island

Alco-G. E. passenger locomotives for service on the "Arizona Limited"
Develop 53,000 lb. tractive force and 2,000 hp.

THE Chicago, Rock Island & Pacific recently took delivery of two Alco-G. E. 2,000-hp. Diesel-electric road passenger locomotives for service on the "Arizona Limited" between Chicago and Tucumcari, Ariz. Built by the American Locomotive Company, they are each powered by two 1,000-hp. Alco turbo-charged Diesel engines direct-connected to General Electric generators. The traction motors and control equipment are also supplied by the General Electric Company. The locomotives are carried on two six-wheel trucks, weigh 330,000 lb., and are designed for maximum speeds of 120 m. p. h. The starting tractive force, at 24 per cent adhesion, is 53,000 lb.

The general structure of these locomotives consists of a welded steel underframe on cast-steel, six-wheel trucks with a cab having a sloping front end and a conventional passenger-car-type vestibule at the rear end. The air brake and train-control equipment is located under the low hood at the forward end and this space is entered through a door from the operator's compartment. The latter compartment, 7 ft. 6½ in. long, has exterior doors at both sides of the locomotive and doors on both sides leading into the engine compartment.

The two engines are located on the center line of the locomotive with the main and auxiliary generators and turbo-chargers at the forward end of each engine and the air compressors and radiator ventilating fans at the rear end of each engine set. The engine compartment is approximately 47 ft. long. Two Vapor Clarkson 1,600-lb. per hr. steam generators for train heating are located at the left side of the rear end of the cab. A radiator chamber is located at the rear of each engine and is arranged with two standard 11-section radiators, one on each side of the locomotive. Each engine and its cooling equipment is an individual unit. The cooling is accomplished by drawing air into the radiators in the side of the locomotive and discharging it from the roof. The 54-in. radiator fans are located in funnels just under the

roof to which the radiator plenum chambers are connected. A total of 17 radiator sections are used for cooling engine water and 5 sections for cooling lubricating oil. Each radiator is equipped with manually-operated shutters.

Ventilators are located in the roof of the engine compartments to provide cool air for the engine, traction blowers, boilers, etc., and to discharge heated air from the engine room.

Underframe and Cab

The underframe is of welded construction employing standard rolled sections. The center sills are H-beams

General Characteristics of Rock Island 2,000 Hp. Diesel-Electric Road Locomotives

Total engine brake horsepower (for traction)	2,000
Driving motors, number	4
Maximum speed restriction, m.p.h.	120
Driving wheels, (four pairs) diameter, in.	40
Idling wheels, (two pairs) diameter, in.	40
Wheel base, truck, rigid, ft.-in.	15-4
Wheel base, total locomotive, ft.-in.	58-4
Weights:	
On driving wheels, lb.	220,000
On idling wheels, lb.	110,000
Total locomotive, lb.	330,000
Maximum overall dimensions:	
Height, roof, ft.-in.	13-6
Height, maximum, ft.-in.	14-4
Width, inside cab sheets, ft.-in.	9-9
Width, maximum, ft.-in.	10-6
Length, overall, ft.-in.	74-9¾
Starting tractive force, (at 24 per cent adhesion), lb.	53,000
Maximum radius curvature, deg.	21
Lubricating oil capacity, per engine, gal.	80
Fuel oil capacity, total, gal.	1,200
Engine cooling water capacity, per engine, gal.	325
Boiler water capacity, gal.	1,000
Sand capacity, cu. ft.	20

12 in. deep with bolsters of plate and I-beam construction forming a rigid box section. The center plates and draft-gear housings are steel castings, the former being welded to the underframe and the latter riveted. The

center plates are protected from wear by steel liners lubricated from oil cups located in the engine compartment.

The cab framing is of truss design, welded throughout, using standard rolled sections. The cab roof is of semi-elliptic cross sections framed of rolled sections welded together and riveted to the side frames. Hatchways are provided in the roof for the removal of engines, generators and train heating boilers. The main hatches also have smaller openings with hinged covers as a means of access for the inspection and removal of pistons.

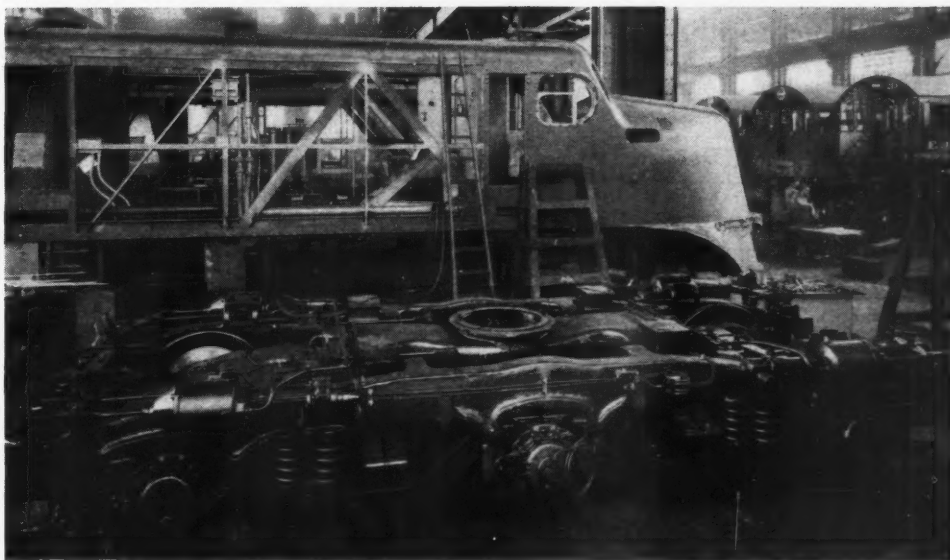
The walls and the roof of the operator's cab are lined inside with metal sheathing and the space between this sheathing and the outer covering is filled with insulating material. The bulkhead between the operator's cab and the operator's compartment is an insulated wall. All of the cab doors are of metal construction or metal covered. In addition to the two side exit doors in the operator's compartment there are side exit doors at the approximate center of the engine compartment.

The windows across the front of the operator's cab



The Engineman's Station and Controls

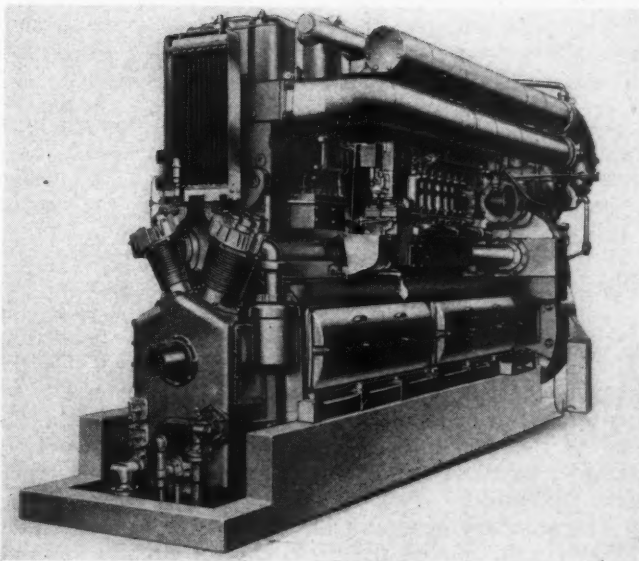
A Shop View of One of the Six-Wheel Trucks And a Cab Under Construction in The Background



and in the side walls of the engine compartment are the fixed type with rubber weather seals. The side windows of the operator's cab are the combination type with a controlled drop section and a front section hinged for ventilation. All window frames are of metal construction and all windows are fitted with safety glass. There are window wipers, defrosters, and sun visors for both front windows.

The Diesel Engines

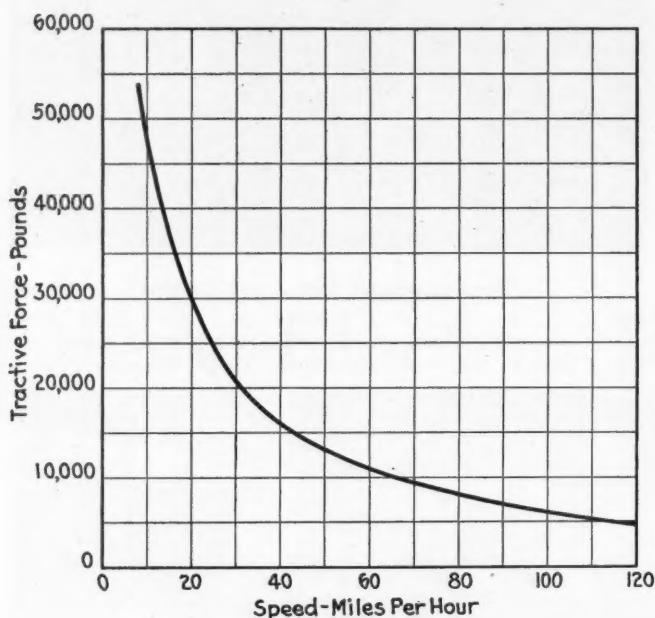
The locomotive is powered by two Alco six-cylinder, vertical, four-cycle, turbo-charged Diesel engines developing 1,000-hp. at normal running speed of 740 r. p. m. These engines have a bore of $12\frac{1}{2}$ in. and a stroke of 13 in. The engine base is cast aluminum alloy. In basic design, these engines are identical to the engines used in Alco-G. E. switching locomotives. However, because of the higher average load factor of the engines in road service, a different cylinder head is used which embodies slightly larger valves and larger port areas than the cylinder head used on the switcher engine. At the full load of the engine, the turbo-chargers operate at moderate speeds, approximately 30 per cent below their normal designed speed. The use of cast aluminum engine



One of the Turbo-Charged, 1,000 Hp. Alco Diesel Engines Showing the Two Stage Compressor

bases on the engines for the road locomotive is for the purpose of reducing weight.

Another point of difference in these engines is the built-in air-brake compressor. In co-operation with the Westinghouse Air Brake Company, a two-cylinder two-stage compressor was developed for direct attachment to the end of the engine opposite the generator. There is a crankshaft extension bolted to the end of the Diesel



Tractive Force-Speed Curve of the 2,000 Hp. Rock Island Locomotive

engine crankshaft for the compressor cylinder connecting rods. The intercooler for this compressor is mounted on the end of the engine above the compressor itself. This compressor has a displacement of 114 cu. ft. per min. at full engine speed or a total of 228 cu. ft. per min. for both compressors. The engine lubricating oil pump is mounted inside this air-brake compressor crankcase and is driven from the crankshaft extension.

Provision is made by the extension of this crankshaft beyond the compressor for the V-belt pulleys which drive the radiator fan for each engine and the traction-motor blower fan in the case of the No. 2 engine. On the No. 1 engine this fan is driven by an extension of the generator shaft.

Electrical Equipment

Capacity ratings of the electric-drive equipment have been made ample to meet all service requirements. Several improvements have been incorporated in the design including a special control for maintaining the engine load.

Each of the two engines drives a direct-connected main generator, an auxiliary generator, mounted on an extension of the shaft of the main generator, and a split-pole exciter mounted on the top of the auxiliary generator. The main generator has ample capacity to convert the available output of the engine and a special feature is incorporated in the form of a speed switch mounted on the end of the exciter shaft which keeps the engine fully loaded regardless of altitude, temperature or other variable conditions.

The auxiliary generator has a rating of approximately 11 kw., and supplies power to control circuits, lighting circuits and all auxiliaries that are electrically operated as well as power for charging the 32-cell, KT 35, Exide

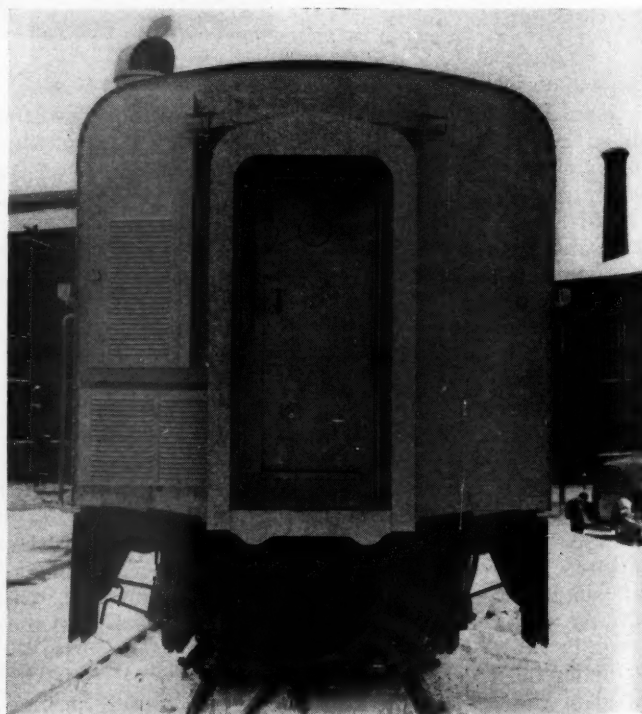
battery having an eight-hour rating of 291 amp.-hr. The armature is mounted on the main generator shaft extension and the frame of the generator is bolted to the main generator bearing bracket. The auxiliary circuit voltage is held constant at 75 volts throughout the speed range of the engine by a voltage regulator.

The exciter which furnishes excitation for the main generator is mounted on the top of the generator frame and is belt driven from the main engine shaft. This exciter is a split-pole machine with a special magnetic circuit which maintains generator horsepower constant throughout the normal speed range of the locomotive.

Current from the two main generating plants is supplied to four GE-730 single-g geared traction motors of the conventional four-pole, commutating-pole design. Constant oil level bearings are used for the axle bearings. A feature of this equipment is the forced oil lubrication of the gear and pinion. By use of an oil-tight and dust-tight gear case and special construction of the gear and pinion, a constant stream of fresh oil is supplied at the point of contact by forcing out the lubricant through holes in the gear rim. The gear rim is a separate part bolted to the hub so as to eliminate distortion and maintain the teeth in shape and correct alignment. Both armature bearings are of the roller type and the armatures are dynamically balanced. Both the bearings and shafts are made unusually large to allow an adequate safety factor. The gearing (58/25) permits a maximum safe speed of the locomotive of 120 m. p. h.

The conventional control for locomotives of this type is so arranged that there are two completely independent power plants from each of which two motors are first started in series, then transferred to parallel and from parallel to reduced field connection. Provision is also made for the operation of locomotives of this type in multiple.

Power supply is regulated in eight steps by the controller handle at the engineer's position. The motor connections on each power plant are changed automatically to the several operating positions. These connections are controlled by relays which effect the transfer of connections not only at reduced speed but over the entire range



At the Rear End Is A Standard Passenger-Car Vestibule

of operation. These relays also disconnect the field-shunting contactors if the locomotive speed drops to a point below the predetermined range for shunt-field operation.

Direction of movement of the locomotive is controlled by a small reverse handle in the master controller. This has three positions, forward, off and reverse. Wheel-slipping relays operate an indicating lamp to warn the engineer of wheel slipping while the motors are operating in series, and prevent transferring to parallel operation while this condition exists. These lights also flash momentarily during transfer to parallel to give indication of the operation on each power plant.

Trucks, Draft Gear and Brake Equipment

The trucks under these locomotives are six-wheel pedestal-type trucks with one-piece cast-steel frames, side equalizers, coil springs and swing bolsters carried by semi-elliptic springs at four corners. The trucks are arranged for the application of motors to the end axles, the middle axle being an idler. The motors are ventilated through the truck center plates. The wheel and axle assembly can be removed with or without the motors. The center plates are fitted with high-carbon-steel side and bottom liners with horizontal liners of the truck center plate removable for shimming. The center plates are oil lubricated and protected with dust guards. The truck pedestal jaws are fitted with hardened spring-steel liners. The rolled-steel truck wheels are 40 in. in diameter and are mounted on axles of open-hearth steel with 7-in. journals carried in Timken roller bearings. Each journal is fitted with a Timken heat indicator. Clasp brakes are

Partial List of Material and Equipment on the Rock Island 2,000 Hp. Road Locomotives

Conduit (aluminum)	Aluminum Co. of America, Pittsburgh, Pa.
Electrical equipment	General Electric Company, Schenectady, N. Y.
Storage battery (Exide)	Electric Storage Battery Co., Philadelphia, Pa.
Soundproofing; Burgess acoustic	Pyle-National Company, The, Chicago
Pipe covering	Union Asbestos & Rubber Co., Chicago
Radiator fans	General Electric Company, Schenectady, N. Y.
Shutters	Kysor Heater Co., Cadillac, Mich.
Air-compressor strainers; air-compressor intercooling units	Westinghouse Air Brake Co., Wilmerding, Pa.
Motor trucks	General Steel Castings Corp., Eddystone, Pa.
Truck wheels, rolled steel	Carnegie-Illinois Steel Corp., Pittsburgh, Pa.
Roller bearings; roller-bearing heat indicator	The Timken Roller Bearing Co., Canton, Ohio
Springs	American Locomotive Co., Railway Steel Spring Div., New York
Couplers; Coupler yokes; draft gear	National Malleable and Steel Castings Co., Cleveland, Ohio
Truck, clasp, brake	American Steel Foundries, Chicago
Brake, operating; slack adjuster; brake cylinders, aluminum	Westinghouse Air Brake Co., Wilmerding, Pa.
Brake shoes	American Brake Shoe & Foundry Co., New York
Hand brake	National Brake Co., Buffalo, N. Y.
Cab doors	The Morton Mfg. Co., Chicago
Cab doors	Haskelite Mfg. Corp., Chicago
Tread plate, aluminum; partition plates	Aluminum Co. of America, Pittsburgh, Pa.
Vestibule diaphragm	The Morton Mfg. Co., Chicago
Vestibule buffer spring	Standard Railway Equipment Mfg. Co., Chicago
Operator's compartment, drop sash; window glass moulding	O. M. Edwards, Inc., Syracuse, N. Y.
Operating compartment seats	Heywood-Wakefield Co., Gardner, Mass.
Vestibule curtain	The Adams & Westlake Co., Elkhart, Ind.
Train steam heat equipment	Vapor Car Heating Co., Inc., Chicago
Air horns	Westinghouse Air Brake Co., Wilmerding, Pa.
Speed indicator	General Electric Company, Schenectady, N. Y.
Side-wall panels	Haskelite Mfg. Corp., Chicago
Insulation	Johns-Manville Sales Corp., New York
Sanders	Graham-White Sander Corp., Roanoke, Va.
Headlight; classification-lamp lens	The Pyle-National Company, Chicago
Dome lamp	Safety Car Heating & Lighting Co., New York
Classification lamp	American Locomotive Co., New York
Paint	E. I. duPont de Nemours, Wilmington, Del.

used on all wheels. The brake rigging is actuated by four brake cylinders mounted on the sides of the truck frames and fitted with automatic slack adjusters.

The locomotives are equipped with National M-350-A draft gear and National tight-lock couplers, front and rear. The coupler at the front end is the concealed-swivel type.

Automatic and straight-air brakes are applied to all wheels. The operating brake schedule is Westinghouse HSC. The locomotives are equipped with train-control apparatus supplied by the railroad company.

Accidents in 1939

WASHINGTON, D. C.

FEWER persons were killed in railway accidents of all kinds in 1939 than in any other year since accident statistics were first compiled by the Interstate Commerce Commission in 1888, according to Accident Bulletin No. 108 which has just been issued by the commission's Bureau of Statistics. Embraced in this general statement are fatalities to railway employees—"somewhat higher" than in 1938, but in relation to man-hours worked the 1939 employee fatality rate per million was "the lowest yet attained by the railways."

In 1939 railway accidents of all kinds brought death to 4,362 persons and injuries to 28,119. The former represented a decrease of 137 or 3.05 per cent under the 1938 fatalities, while the injuries were 866 or 3.18 per cent in excess of those reported for the previous year. The 1939 fatality rate per million train-miles was 5.17, the lowest since 1930 when a rate of 5.06 was achieved. The 1939 injury rate—33.4—was the same as 1938's; it compares with 1937's rate of 40.0 and 1930's 45.7. Other post-1930 injury rates ranged from 34.3 to 39.0.

Train and Train-Service Accidents

The 214 persons killed in 1939 train accidents was a reduction of 79 fatalities under the total for 1938, but the number injured in such accidents—1,422—represented an increase of 349 as compared with the previous year. In 1939 there were 6,074 train accidents, an increase of 392 over 1938's 5,682. (Accidents resulting from the movement of trains, locomotives or cars are classified as "train" accidents if any railway property is damaged in excess of \$150; accidents arising in connection with the operation of trains, locomotives or cars that result in reportable casualties to persons, but not in damage to equipment or other railway property in excess of \$150, including the cost of clearing the wreck, are classified as "train-service" accidents.)

Train-service accidents in 1939 resulted in the death of 3,942 persons, principally trespassers and persons at grade crossings. This was a decrease of 54 as compared with 1938's 3,996, and thus supplants the latter as best record of the 1930-1939 period. Meanwhile, 14,588 persons were injured in 1939 train-service accidents, an increase of 159 as compared with 1938, but better than the record of any other year of the 1930-1939 period. The 1939 fatalities in non-train accidents, totaling 206, compared with 1938's 210; but here again the injuries were above those of 1938—12,109 as compared with 11,751.

The Bulletin's chart showing the relative importance of various classes of persons in the 1939 fatalities from

(Continued on page 285)

Grading Troubles Featured

This Crossing Elimination Job

Unstable slopes and soft road-bed encountered in long cuts on Staten Island project—Stations and drainage systems present other interesting features

SOFT spots, or "muck holes," excessive ground water and the general instability when wet of the material in which most of the excavation was carried out combined to produce difficult grading problems in the prosecution of a recently completed grade-separation project on the electrified Staten Island Rapid Transit Lines of the Baltimore & Ohio. Other features of interest on this undertaking, which is known as the Great Kills-Huguenot project, include the extensive drainage systems for handling surface and subsurface water, and the four passenger stations that were constructed. This project, which involved the elimination of seven grade crossings and necessitated the revision of grades over 3½ miles of double-track line, was carried out at a total cost of about \$2,750,000.

Background

The Great Kills-Huguenot project comprises one step in a program that is now in progress looking to the elimination of all the railway-highway grade crossings on Staten Island, where the Staten Island Rapid Transit Lines comprise the only railroad. Staten Island, which is situated in lower New York bay adjacent to the east shore of New Jersey, forms part of the City of New York and contains a considerable number of suburban residential communities. All the rapid transit lines on the island have a common terminal at St. George at the northeasterly end of the island, which is a point of transfer for passengers between trains and ferry boats plying to and from Manhattan and Brooklyn.

From St. George, one line, known as the North Shore line, extends westerly along the north shore of the island to Arlington, while another line extends southerly along the east shore to Clifton, where it divides into two lines. One of these, known as the South Beach line, continues in a generally southerly direction to South Beach, while the other, which is designated as the Tottenville line, extends in a generally southwesterly direction, paralleling the south shore, at an average distance from it of about a mile, for the entire length of the island, the rails terminating at Tottenville, with ferry service at Perth Amboy, N. J. It is the latter line, about 13 miles in length, on which the grade separation project described in this article is located.

The elimination of grade crossings on Staten Island is being carried out as part of a plan for the elimination of all such crossings within New York City. The first grade separation structures on Staten Island were built in 1913 on the Tottenville line, and since then, and at an accelerated pace in recent years, successive projects have

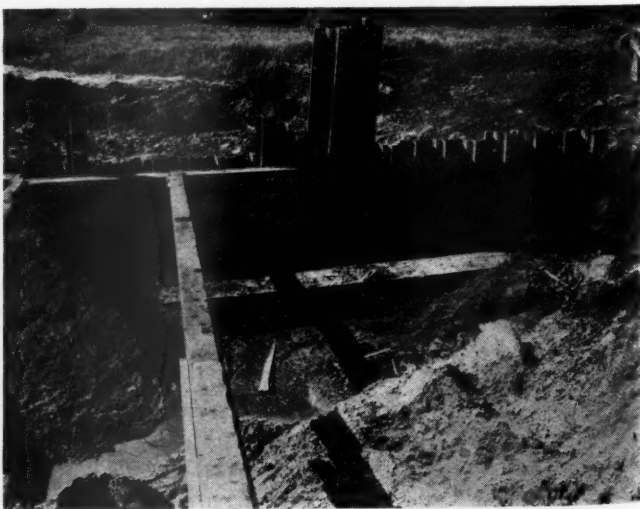
been carried out, which, by 1938, had involved the elimination of all 22 of the crossings on the North Shore line, of 18 crossings on the South Beach line, which covered all but one crossing on that line, and of 24 crossings on the Tottenville line.

Recently, several elimination projects have been completed on the Tottenville line, including the Great Kills-Huguenot job and the Tottenville project, each involving 7 crossings, and a project involving a single crossing at Richmond Valley road. These, with other projects soon to be undertaken involving the remaining 14 crossings, will complete the elimination of all grade crossings on Staten Island. It is contemplated that the last of these projects will be completed in 1942.

The first grade separation projects carried out on the Tottenville line involved the construction of two highway underpasses, one slightly east of the Great Kills station and the other immediately west of the Huguenot station. Both of these structures carry the railroad over Amboy road which, following the tracks between the two points on their south side, intersects them at both locations. These underpasses are about 3½ miles apart and it is the trackage between them that was involved in the Great Kills-Huguenot job. Originally, all intersecting streets in this distance, of which there are seven, crossed the tracks at grade. These are, proceeding from east to west, Great Kills road, Giffords lane, Benham boulevard, Richmond avenue, Arden avenue, Annadale road and Huguenot avenue. There are four stations in the same distance, namely, at Great Kills, Eltingville, Annadale and Huguenot.

Method of Separation

To separate the grades in this territory the tracks were depressed in cuts for distances at both ends of the project, with the intersecting streets being carried overhead on bridges, while that section of the line between the cuts was raised on an embankment and the streets



Section of Sheet Piling at One of the "Muck Holes." The Timbers Are Braces Reaching to Sheet Piling at Other Side of Cut

Right—A Typical Section of the Completed Cut and Tracks Between Great Kills Road and Giffords Lane. The Tell Tale Is on the Site of the Worst "Muck Hole" That Was Encountered



The View at the Left Is Illustrative of the Soft, Wet Conditions That Were Encountered During the Excavation Work

carried underneath. The cut at the east end is about 3,500 ft. long and has a maximum depth of about 28 ft. There are two overhead bridges in this section, one at Great Kills road and the other at Giffords lane. That portion of the revised grade that is carried on an embankment is about 6,400 ft. long, and in this section the fill has a maximum height of about 26 ft. There are three street underpasses in the elevated section, namely, proceeding from east to west, at Benham boulevard, Richmond avenue, and Arden avenue.

The cut section at the westerly end of the project is nearly 7,200 ft. long and ranges up to 30 ft. in depth. There are two overhead bridges in this section, one at Annadale road, near the easterly end of the section, and the other at Huguenot avenue, which is near the westerly extremity of the project. Thus there are four highway bridges and three railroad bridges. Both the cuts and the fill on this job have slopes of $1\frac{1}{2}:1$, although at several locations in the cuts retaining walls are provided in the vicinity of the bridges.

Passenger Stations

All of the existing passenger stations within the territory covered by this project were replaced with new structures, each located at the street level and forming an integral part of a grade-separation bridge. Three of the stations are located on street bridges, the decks of which are of sufficient width to accommodate the stations as well as the streets and sidewalks, while the fourth station is placed underneath the railroad bridge at one of the street underpasses. The three overhead stations are at Great Kills, Annadale and Huguenot, with the buildings located on the Giffords Lane, Annadale Road and Huguenot Avenue bridges, respectively. The low-level station is at Eltingville and is located under one of the spans in the Richmond Avenue bridge.

In carrying out this project, railroad traffic was diverted to a single-track detour line to permit the construction work to proceed in the clear. However, because of operating considerations and power-supply difficulties

that would have attended the operation of a single-track detour extending the entire length of the project, it was necessary to divide the work into two sections, each of which was constructed practically independently.

Section No. 1 embraced the cut at the easterly end of the project. The detour track for this section was nearly 4,000 ft. long and was placed on the south side of the existing tracks. On Section No. 2, which embraced the remainder of the project, the detour track was located on the north side of the right of way. Because of the length of this detour track, about 14,000 ft., it was necessary to provide a passing track at Annadale, about midway of its length. During the construction work passenger business was served from temporary frame stations.

Grading Problems

The grading difficulties encountered on this project were of two different types, one of which involved the sliding of the slopes in the cuts and to a lesser extent in the fills, while the other was manifested in the instability of the subgrade, both at localized points and over areas of considerable extent. The sliding of the slopes was due in part to the fact that the subsoil in the vicinity of the project consists largely of a sandy clay which breaks down readily in the presence of water. Also, ground water was encountered at a relatively shallow depth, and it was found that this water was confined in crevices or veins filled with sand.

The crevices were encountered frequently in the cut slopes at certain locations, and at such points the percolation of water from the veins caused the surface of the slopes to become saturated. In such instances cleavage planes formed between the relatively dry underlying material and the moistened clay on the surface, permitting the latter to slough off. To overcome this difficulty it was necessary to install suitable subsurface drains in the slopes for disposing of the water coming from the crevices. Also as a means of further stabilizing the cut slopes and protecting them from erosion, they were cov-

ered with either sod or a blanket of cinders, the latter material being used most widely.

The subsurface drains in the slopes are of the French type, consisting of trenches backfilled with permeable materials, including one-man stone in the bottom and crushed stone on top. In several instances, open-joint drain tile was installed in the drains, but for the most part no drain pipe was used. As a rule the slope drains consist of a main drain providing an outlet to the side ditch, with connecting branches placed to tap wet spots in the immediate vicinity. Indicative of the extent to which it was necessary to apply the slope drains is the fact that at one location a total of 500 cu. yd. of stone was installed in the slopes in a distance of 500 ft.

The drainage in the slopes did not always take the form of French drains. At one location, a short distance east of the Huguenot station, general slides occurred throughout a distance of several hundred feet following a rain storm, and here the treatment consisted of the removal of all the unstable material in the affected area, the application of a layer of one-man stone to the surface thus exposed, and the backfilling of the excavated area with crushed stone. This material was in turn covered in the usual manner with a layer of cinders.

"Muck Holes"

The grading difficulties that were experienced because of the instability of the subgrade in the cuts were for the most part localized and were attributable to pockets of saturated materials, such as peat and blue clay. These pockets, which might have been formed by the filling of ancient stream beds by glacial action, were exceedingly troublesome, owing to their almost total lack of bearing power. In fact, in a number of instances crawler-mounted equipment became mired fast at these locations.

These pockets, or "muck holes" as they were called, ranged from 100 ft. to 300 ft. in length and, in general, the treatment consisted of the removal of the soft material, which was relatively limited in depth, and the backfilling of the excavation with crushed stone. In some locations where the muck was unusually deep, the backfilling was made with one-man stone or old paving blocks, topped off with crushed stone. The muck holes were shaped in the bottom to drain to one side of the cut, and the subsurface drain pipe, connected with the main drainage system, was installed as needed.

At two locations it was necessary to drive steel sheet piling to permit the excavation of the muck holes, and a description of the work carried out at one of these locations will serve to demonstrate the nature of the difficulties that were encountered. At this particular

location, which is in the vicinity of Great Kills road, near the extreme easterly end of the project, the cut is about 13 ft. deep and the detour track was located close to the edge of the cut on the south side. A particularly troublesome muck hole, which proved to be about 300 ft. long, was encountered at this point.

Owing to the presence of the soft material, the sides of the cut showed a marked tendency to flow inward as the excavating work progressed. This flow of material on the south side of the cut endangered the stability of the detour track, and to protect this track a line of sheet piling was driven on the location of the toe of the slope. The top of this line of piling was approximately at the surface of the ground, but when the detour track was abandoned the piling was cut off at the ditch line and the slope finished.

On the north side of the cut at this location the soil was even more unstable than on the south side. Here the sheet piling was driven along the top of the slope, and all the material between the two lines of piling was removed to an average depth of about 4 ft. and a maximum depth of 10 ft. below the subgrade. The excava-



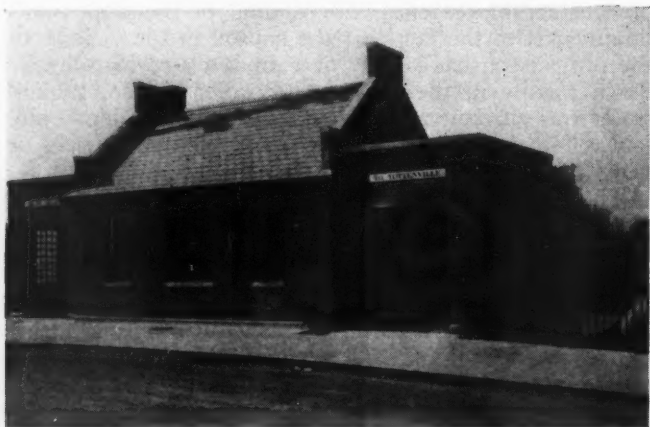
The Great Kills Station and Platforms as Seen From the Overhead Walkway

tion was then backfilled in the same manner as described for the other muck holes. Also a system of subsurface drains was installed. When backfilling the hole, a slope of suitably stable material was built up against the north line of piling to replace the unstable material that had been removed and when the job was finished this section of the cut had the same appearance as adjacent parts of the excavation.

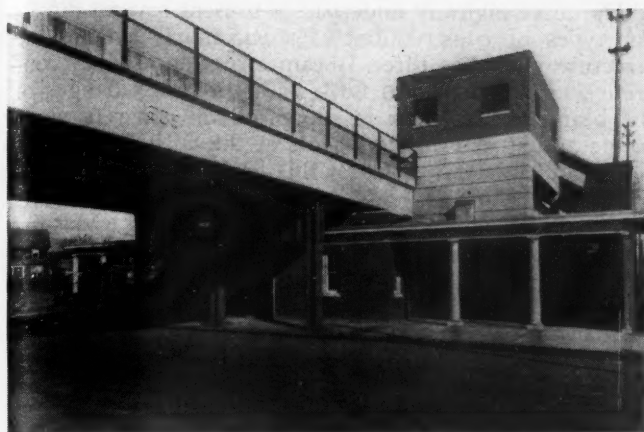
Another Soft Location

In the cut at the west end of the project, the subgrade was exceedingly soft throughout a distance of about 2,600 ft., owing to the presence of excessive amounts of surface and subsurface water. To remedy this condition, the soft material was removed to a depth of 1 ft. to 3 ft. below the subgrade, the bottom of the excavation being sloped to drain toward one side of the cut. This excavation was then backfilled with crushed stone up to the level of the subgrade and a longitudinal line of 8-in. drain tile was installed.

The measures that were employed to protect the slopes



The Station at Annadale Is Typical of the Three Stations That Were Built on Overhead Bridges



The Eltingville Station, Shown in This View, Is Located Under the Richmond Avenue Bridge

from erosion in both the cuts and the fills on this project were of a comprehensive nature and involved a variety of treatments. Between the easterly end of the project and the Great Kills station the slopes were sodded, but throughout the remainder of the work locomotive cinders were used except in the vicinity of stations and bridges, where, for the sake of better appearance, the slopes were sodded for a distance of about 200 ft. on each side. The cinders were placed on the slopes in a blanket approximately 10 in. in thickness, nearly 25,000 cu. yd. being used. In addition to the use of cinders and sod, other measures that were taken to protect the cut slopes included the use of berm ditches along the tops of the slopes and the construction at frequent intervals of flumes for carrying the water from these ditches down the slopes to the side ditches. These flumes are usually either of concrete construction or of half-round clay drain tile set in concrete.

Drainage Systems

The area covered by this project lacked storm water sewers, the surface water being collected in one main and several small streams which roughly paralleled the rail-

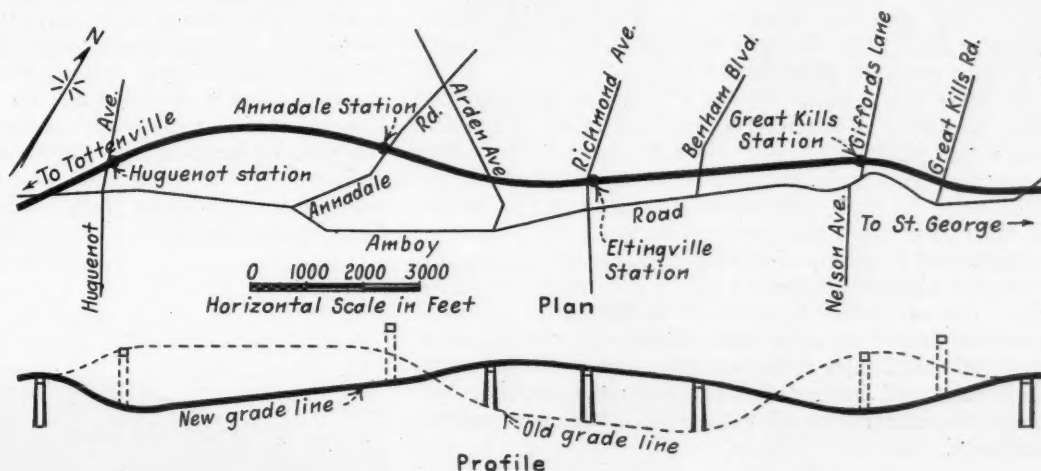
creasing, as other drainage was picked up, to a 68-in. flat-base concrete pipe and ending in a reinforced concrete box and flume having a cross-sectional area of about 30 sq. ft. for a length of about 1,800 ft. The easterly end of the Annadale-Huguenot cut was connected to this storm water drain by a cut drain having a length of approximately 1,100 ft., using 12-in. and 18-in. vitrified pipe laid under the ditch on one side of the tracks. The Great Kills cut and the westerly end of the Annadale-Huguenot cut were drained in a similar manner, using vitrified tile up to 27-in. in diameter, with a short section of 33-in. reinforced concrete pipe in the Annadale-Huguenot cut.

In all of the cuts, combination catch basins and man-holes were provided at frequent intervals to pick up the roadbed drainage. From the catch basins in the main drains, laterals extend to catch basins on the other side of the tracks, and necessary connections to the slope drains were also provided. Storm water drainage, as required at the various streets, was installed and connected to the main drainage system at convenient points and a considerable number of culverts were constructed under the tracks and streets at various locations. Cast iron pipe was used for all small laterals under the tracks and, in general, vitrified tile was used for all other drainage pipes up to and including the 27-in. size. Where larger pipes were required, circular reinforced concrete pipe from 30-in. to 48-in. in diameter, inclusive, was used, the largest of these being exceeded in size only by the 68-in. flat-base concrete pipe forming part of the new storm water drain.

Details of Stations

The stations at Great Kills, Annadale and Huguenot, which, as noted previously, are located on overhead street bridges, are substantially similar in design and arrangement, while the station at Eltingville, which is located under the tracks, involved a different treatment. Each of the overhead stations embodies a central unit, rectangular in plan, with the long dimension transverse to the tracks, which contains the waiting room, toilet facilities and a small space for the heating plant. At both

Condensed Plan and Diagrammatic Profile of the Trackage Between Great Kills and Huguenot, Showing the New and Old Grade Lines



road, with occasional crossings in the area from Annadale road to Benham boulevard. This surface drainage was under-cut by the new profile, making it necessary to provide drainage facilities at the lower elevation between the above limits. This new storm water sewer, having a total length of about 5,700 ft., began at the westerly end with a 30-in. reinforced concrete pipe, in-

ends of the central unit are porticos which provide direct access from the street sidewalk to the stairways leading down to the station platforms. Doorways connect the porticos with the waiting room.

The floor plan of the Eltingville station is in general similar to those of the overhead structures, except, of course, that this station is directly underneath the tracks,

being located adjacent to the east abutment of the bridge across Richmond avenue. However, since approaching trains cannot be seen from the main waiting room at this location, a small supplementary waiting room to serve eastbound (Manhattan and Brooklyn) traffic was provided at the track level adjacent to the south platform. Since very little westbound business originates here, it was not necessary to provide a supplementary waiting room at the track level on the north side of the tracks.

All four of the stations are colonial in design, with combination brick and tile walls and precast concrete copings and window sills. The roof of the station at Eltingville is necessarily flat, but the three overhead stations have gable-type roofs covered with slate shingles. All window sash and frames are of metal, while panels of glass blocks are provided in the end walls of the brick porticos at the overhead stations. The cream-colored tile forming part of the interior walls provides an attractive and economical finish, with ceilings of Celotex painted to match.

This Station Different

While the porticos at the three overhead stations have brick walls and are otherwise similar in construction to the remainder of the structures, those at the Eltingville station were treated somewhat differently, being more thoroughly colonial in appearance than those at the other stations. Each of these porticos is situated in the angle formed by the end wall of the station and the bridge abutment. They are of timber construction with flat roofs supported on the two open sides by circular fluted columns. Roof-supporting beams span between the front row of columns and pilasters in the face of the bridge abutment. The porticos are floored with concrete while the ceilings are of tongue-and-groove material with V joints. The decorative scheme includes a cream color for the columns, pilasters, roof beams and cornice moldings, while the ceilings are painted white.

All the stairways connecting the station and platform levels are of similar construction, consisting of reinforced concrete with metal treads, balustrades of corrugated metal with a flat surface on the inside, and metal columns supporting a flat roof deck covered with built-up roofing. The platforms consist of concrete slabs, 8 ft. wide and 220 ft. long, generally supported on solid concrete bents, except at Eltingville where it was necessary to use bents of precast concrete piles driven into the fill.

At all of the stations except Eltingville, an overhead public walkway is provided at the end of the platforms away from the station. For short distances at both ends of the platforms they are covered with canopies, mostly of the butterfly type, with metal columns and roof decks. On their rear sides the covered parts of the platforms are protected by metal windbreaks, except at one location where the platform is backed up by a concrete retaining wall. The uncovered portions of the platforms are protected on their rear sides with railings of wrought iron pipe. All metal parts at the stations, such as the columns, windbreaks and balustrades, are painted a green color, except the undersides of the roofs, which are painted aluminum.

Types of Bridges

The overhead highway bridges that were constructed as part of this project embody I-beam spans carried on concrete substructures, the number of spans in individual structures ranging from one to three, depending on local conditions. In all cases the I-beams, together with the diaphragms, are encased with gunite and carry a reinforced concrete slab deck.

The three highway underpasses present several different types of construction. At Richmond avenue the structure embodies three I-beam spans encased in concrete which was poured flush with the lower flanges of the beams. This deck is supported on concrete abutments and structural steel bents at the curb lines. The center and westerly spans of this bridge carry the roadway and a sidewalk, respectively, while the Eltingville station and a sidewalk in front of it are located under the easterly span. At Arden avenue the bridge is a three-span structure with a roadway and two sidewalks and is of the through plate-girder type, with a concrete slab deck supported on I-beams encased in concrete and with a substructure embodying concrete abutments and steel bents. The bridge at Benham boulevard is similar to that at Arden avenue except that it has only one span.

The project was financed under the New York State bond issue fund with the aid of a grant by the Public Works Administration, and was carried out under the terms of the new constitutional amendment which limits the participation of the railroads in such projects on the basis of net benefits to a maximum of 15 per cent. The project was under the general direction of H. A. Lane, chief engineer of the Baltimore & Ohio, with E. L. Gosnell, principal assistant engineer, in general charge of work in the field and of negotiations with public authorities. The bridges were designed under the supervision of the late P. G. Lang, engineer of bridges until his death on December 9, 1939, and C. E. Sloan, then assistant engineer of bridges and now engineer of bridges. The stations were designed under the supervision of L. P. Kimball, engineer of buildings. W. N. Young, assistant engineer, has general charge of all grade-elimination work on Staten Island and D. W. Tilman, field engineer, had direct charge of this project.

The Transit Commission, a state-appointed body dealing with transit matters in New York City, was represented in the field by a corps of inspectors under the direction of Henry Heins, Jr., chief engineer, and Sander Schwartz, chief, division of railroad engineering, while the Public Works Administration had a similar organization under William Mueser, chief resident engineer-inspector. C. K. Conard represented the Board of Estimate of the City of New York, and H. W. Ordeman, consulting engineer, represented the Borough of Richmond. All grading and heavy construction work was performed under contract by the Poirier & McLane Corporation, New York, which firm also constructed the roadbed for the detour track on Section 2. The Caye Construction Company, Inc., Brooklyn, N. Y., had the contract for building the stations and the overhead public walkways. The track work and the construction of the roadbed for the detour track on Section 1 was performed by company forces.

* * *



Photo by E. K. Heath

Central Vermont Locomotives Nos. 703 and 704 About to Leave St. Albans, Vt., With the Chicago-New York "Dairy" Train

Bureau of Safety Annual Report

WASHINGTON, D. C.

THE annual report of Director S. N. Mills of the Interstate Commerce Commission's Bureau of Safety for the fiscal year ended June 30, 1940, is a 51-page document setting forth in the usual form the results of inspection of safety-appliance equipment on railroads together with information on the hours-of-service records of employees, installations of signaling facilities, investigation of accidents, and other activities of the Bureau.

During the year under review a total of 1,142,121 cars and locomotives was inspected; 28,616 or 2.51 per cent were found defective, as compared with 2.55 per cent defective out of the 1,144,168 inspected in 1938-39. Included in the rolling stock inspected during fiscal 1940 were 23,703 passenger-train cars, of which 734, or 3.1 per cent, were found with defective safety appliances, 1,352 defects being reported.

Air-Brake Tests

Air-brake tests were made on 2,377 trains, consisting of 109,711 cars, prepared for departure from terminals; air brakes were found operative on 109,610, or 99.9 per cent, of these cars. This percentage, however, was attained only after 757 cars having defective or inoperative brakes had been set out, and repairs had been made to the brakes of 694 other cars in the trains. "It should be borne in mind," says the report's usual statement in that connection, "that these figures refer to trains which had been prepared for departure, yet when afterward tested by our inspectors, it was found necessary to set out or repair the brakes on an average of over three cars for every five trains." Similar tests on 761 trains arriving at terminals with 37,492 cars showed that the air brakes were operative on 98.33 per cent of the cars—the cars with inoperative brakes averaging over two for every three trains tested.

Commenting on the program for equipping cars with AB brakes, the report recalls how its three immediate predecessors referred to the "slow progress" on that program and urged "appropriate action to expedite this improvement." During the fiscal year under review 91,950 additional cars were equipped. Of this the report says: "As shown by the foregoing record, during 5½ years, or 55 per cent of the 10-year period allotted for making this improvement, only 18.4 per cent of the freight cars in interchange service have been equipped with the present standard air-brake apparatus." This 18.4 per cent is a composite figure, representing 19.75 per cent of the railroad-owned cars and 9.82 per cent of those owned by private car lines.

The Bureau continued during 1939-40 its cooperation with carriers and brake manufacturers in the matter of studying braking methods and apparatus to control high-speed trains. In this connection 30 cars equipped with disc-type air brakes have been in regular service and two cars equipped with rotor-type air brakes have been in experimental service. "The Bureau," the report adds, "has cooperated in observations and tests of these new types of brakes which do not utilize car-wheel treads as braking surfaces; also, developments of valvular mechanisms and devices to improve braking efficiency have been followed closely." Moreover the matter of seeing that new streamline passenger-train cars have proper safety-appliance equipment was handled with builders and carriers with satisfactory results. Likewise the Bureau fol-

lowed through on complaints that men have on occasion been required to go between passenger-train cars equipped with tight-lock and type "D" couplers in order to uncouple such cars. Changes in the design of the couplers are expected to cure that situation.

Excess-Service Reports; Signaling Applications

During the year under review, 160 of the 760 railroads filing hours-of-service reports reported a total of 4,269 instances of all classes of excess service—an increase of 486 instances as compared with the previous year.

As was the case in 1938-1939, wrecking and relief service, adverse weather conditions and derailments were again the three most important causes of excess service among train service employees. The 486 instances of excess service over that for the previous year "occurred primarily among operators and in most instances were caused by sickness or death."

As of January 1, 1940, there were 65,256 miles of road (95,887 miles of track) equipped with automatic block signals. On the same date there were 10,556 miles of road (20,450 miles of track) equipped with automatic train-stop, train-control and cab-signal devices. Under the so-called Signal Inspection Law of 1937, the commission received during fiscal 1940 a total of 698 applications for approval of proposed discontinuance or modification of signaling facilities. During the same time 651 applications were acted upon, 649 being approved and two disapproved. The report sets forth the procedure which has been established in connection with these applications.

Alleged violations of the safety-appliance laws in 63 cases, comprising 103 counts, were transmitted to United States attorneys during the year; also, two cases comprising 10 counts alleging violations of the hours-of-service law. On June 30, 1940, there were pending in the various district courts 42 safety-appliance cases containing 75 counts and five hours-of-service cases containing 22 counts.

The report's section on the Bureau's accident-investigation work shows that during the fiscal year under review the commission received reports of 1,722 collisions and 3,568 derailments; in these 146 persons were killed and 1,728 injured as compared with 133 killed and 828 injured in 1938-39's 1,298 collisions and 3,121 derailments. During the first six months of 1940, twenty-seven passengers, three travelers not on trains and 243 employees on duty were killed in railroad accidents of all kinds.

Accidents in 1939

(Continued from page 279)

train and train-service accidents indicates that trespassers constituted 53.75 per cent; persons at grade crossings, 32.34 per cent; employees on duty, 9.05 per cent; and passengers on trains, 0.65 per cent. Of the injured, employees on duty constituted 42.92 per cent; persons at grade crossings, 23.89 per cent; passengers on trains, 15.63 per cent; and trespassers, 12.14 per cent.

Discussing fatalities to passengers, the Bulletin notes how the 1939 record "was much better than that for 1938," 78 passengers having been killed in the latter year as compared with 40 in the year under review. Also, mention is made of the fact that nine of the 1939 fatalities, or 24 per cent, resulted from one derailment "due to malicious tampering with the track." This derailment was the only one fatal to passengers in 1939,

whereas in 1938 43 fatalities to passengers in derailments were reported. "The National Safety Council," the Bulletin says, "has called attention to the fact that a complete showing of the casualties involved in producing railway passenger-miles would include also those happening to persons struck by passenger trains. If such casualties are included the total for 1939 would be 1,775 fatalities and 5,293 injuries involved in passenger service." The 1939 injuries to passengers only totaled 3,320 as compared with 3,008 in 1938, the rate per billion passenger-miles being up from 138.9 to 146.5. At the same time the aforementioned better record as to passenger fatalities produced a 1939 rate of 1.77 per billion passenger-miles as compared with 1938's 3.6.

Casualties to Employees

Before getting into the figures on casualties to employees, the Bulletin observes that "notable progress has been achieved by railway managements in making work less hazardous for their employees." It continues to refer to safety contests and other developments which have "led reporting officers to exercise great care in distinguishing the injuries which are reportable to the Interstate Commerce Commission from those which are not reportable." Thus the reduction in employee injuries from 26.67 per million man-hours in 1925 to 7.03 in 1939 "is in part the result of the prevention of accidents and in part of greater caution in reporting." The Bulletin adds: "There is still sufficient difference in the rates of carriers of about the same size to raise a doubt as to whether the difference in the casualty rates reflects the relative safety of the respective railways or is the result of a difference in the standard of reporting due to varying interest among the carriers as to what constitutes a reportable accident." The range in rates for all employee groups on railways with 1939 man-hours in excess of ten million was 4.04 to 17.32 in the Eastern district; 3.26 to 9.51 in the Southern district; and 2.69 to 17.94 in the Western district. To obtain "some check on the completeness of reports of injuries," the commission has in recent years required the railroads to record and report the number of minor injuries to employees as well as those causing disability of more than three days. (The official requirement is that an accident is reportable if it results in disability in excess of three days.)

In any event the data on officially "reportable" casual-

ties show that 499 employees were killed in 1939 accidents of all kinds, an increase of 20 as compared with 1938's 479 employee fatalities; 1939 injuries to employees totaled 16,954 as compared with 16,163. As noted at the outset, however, the 1939 employee fatality rate per million man-hours worked was the best on record, being 0.207; and the same is true of the 1939 employee injury rate of 7.03.

The 1939 accidents at highway grade crossings brought death to 1,398 persons and injuries to 3,999. The number of fatalities was the smallest reported for accidents of this kind since 1916. And with the exception of 1932 and 1933 ("depression years") the number of 1939 injuries at grade crossings was likewise the smallest reported since 1916. Included in remaining sections of the Bulletin is the usual review of accidents classified according to the speed of the train.

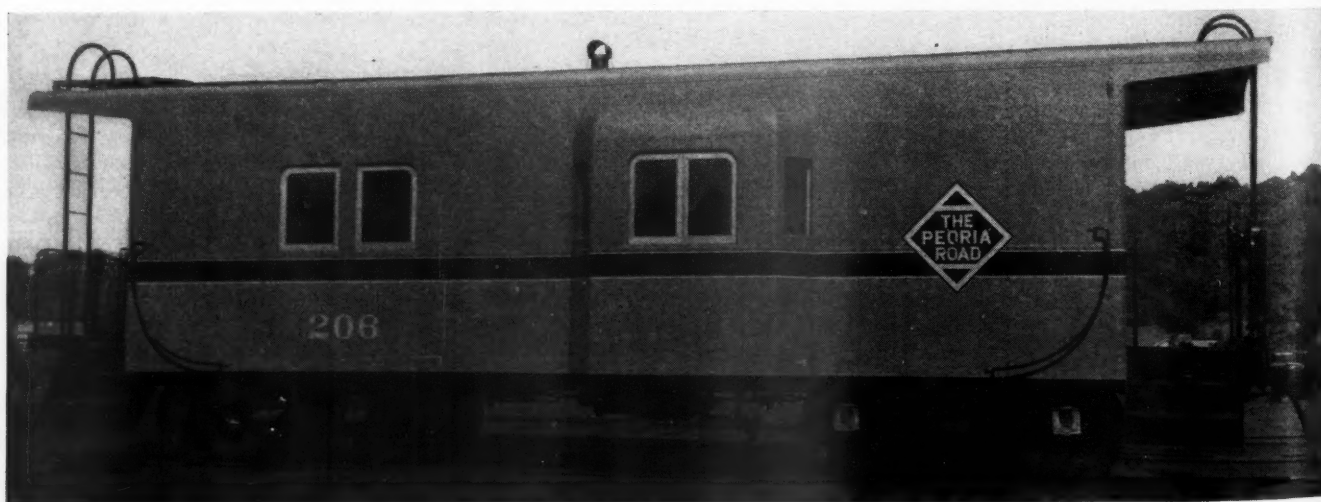
T. P. & W. Builds Steel Caboosees

THE Toledo, Peoria & Western has recently completed six bay-window-type, steel caboose cars in the company shops at East Peoria. These cabooses are said to be a decided improvement over the old cupola-type caboose from the standpoint of safety, comfort and convenience and are much neater in appearance.

The bay window affords the trainmen an excellent view the full length of the train, especially on curves and eliminates any possibility of injury while climbing in and out of cupolas while the train is in motion.

The walls and ceiling are insulated with Fibreglas, and Weather-Tite sheathing insulation is applied in the floor. The middle window in each bay has a sliding sash affording an opening of 20 in. which enables the trainmen to pick up train orders while remaining seated instead of going to the platform, eliminating further hazards of injuries as well as discomfort during inclement weather. The cars are credited with excellent riding qualities due to the weight, low center of gravity and swing-motion trucks.

All welded underframes are used, the center sills being 12-in. I-beams, cover-plated top and bottom. The side and end sills are 8-in. channels. The length over strikers

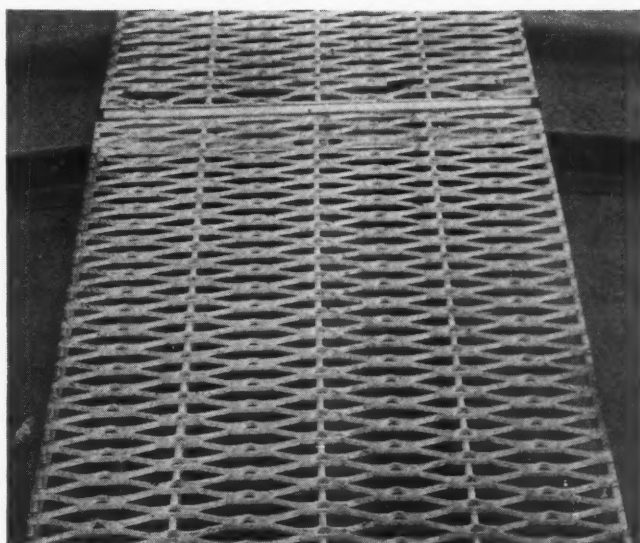


One of Six Caboosees Recently Built by the Toledo, Peoria & Western

is 34 ft. 10 $\frac{3}{4}$ in.; outside length of body, 27 ft. 10 in.; inside length of body, 27 ft. 2 in.; inside width, 8 ft. 2 in.; inside width—bay, 10 ft. 2 in.; outside width—bay, 11 ft.; height of car, rail to running board, 11 ft. 6 in.; height from rail to bottom of bay window, 6 ft. $\frac{1}{2}$ in.

Bettendorf swing-motion caboose trucks with 4 $\frac{1}{4}$ -in. by 8-in. journals are installed, also two-wear wrought-steel wheels, 6 $\frac{1}{4}$ -in. by 8-in. Type-E couplers, M-17 National draft gears with 24 $\frac{5}{8}$ -in. pocket, K-2 triple valve with 10-in. air cylinder and Ajax geared hand brakes (one at each end). The car weighs 46,000 lb.

These caboose cars are equipped with necessary lockers, toilet, ice box, lights, wash facilities, coach-type reversible seats in the bay windows and three seats with 2-ft. by 6-ft. cushions. The insides of the cars are finished with 1 $\frac{3}{16}$ -in. No. 1 fir siding finished with clear varnish. The exteriors of the car bodies are finished in a tile-red color, with a 7-in. Pullman green band running the full length of car and edged with $\frac{1}{2}$ -in. yellow border.



Detail Form of the New U. S. G. Running Board

U.S.G. Expanded-Metal Running Board

A METAL running board having a walking surface of expanded metal of special design has been developed by the United States Gypsum Company, Chicago. The walking surface is made of 12-gage copper-bearing open-hearth steel. This is resistance welded to support beams of the same metal, $\frac{1}{4}$ in. thick. The entire assembly is hot-dip galvanized after fabrication for

The expanded metal in the U. S. G. running board is made to a special design which reduces the tendency to slip and increases strength. The maximum strength per pound of steel used has been obtained by utilizing the natural bridging action of the expanded metal to distribute concentrated loads over a wide area to the support beams. The open area in the walking surface is designed so that the running board will be self-clearing under severe weather conditions.

The U. S. G. expanded metal running board is being offered for application on new and rebuilt cars. The manufacturer states that standard support saddles are used and that a minimum number of man-hours are required in the application of this running board. Keyhole slots in the bolting lugs are said to eliminate the necessity for reaming. No support bars for latitudinal running boards are required.



U. S. G. Expanded-Metal Running Board Applied to a Series of Box Cars

protection against corrosion. Approximately 10 per cent of the weight of the board is said to be galvanizing.

The expanded metal provides a good non-skid walking surface. Cut and expanded from solid steel, it offers a homogeneous walking surface. The expanded strands are turned at a 45-deg. angle to the plane of the walking surface so that the trainman's feet rest on the edges of the strands instead of on flat surfaces. This open mesh construction offers good hand holds at all points.

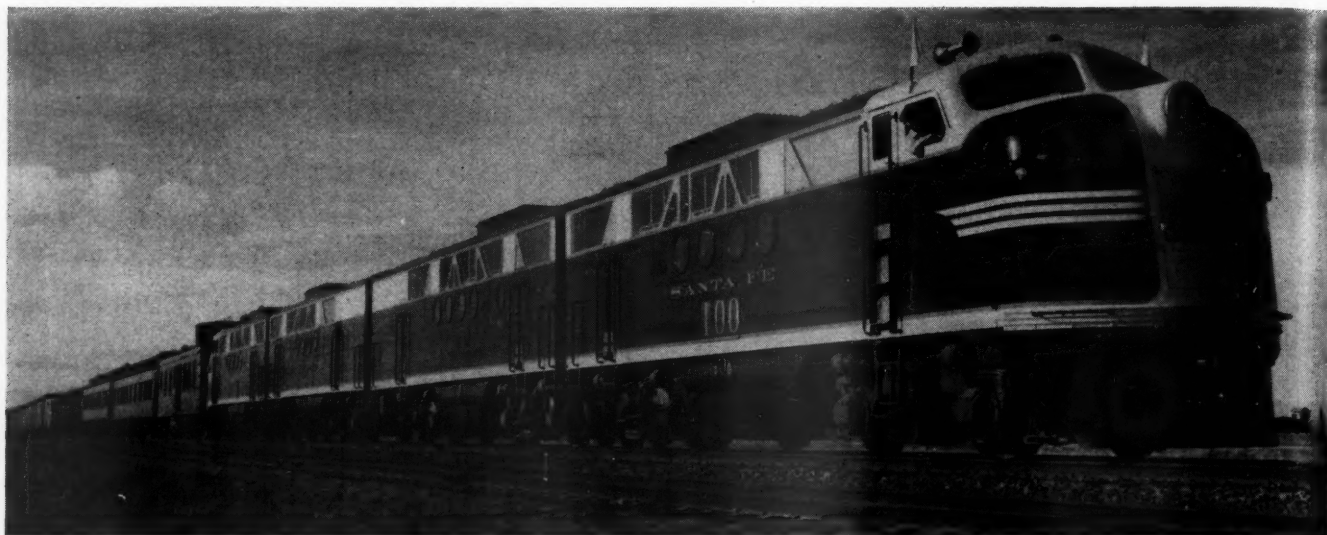
Santa Fe Inaugurates Line-Haul Freight Diesel

THE Atchison, Topeka & Santa Fe became the first railroad to employ Diesel-electric power in extended line-haul freight-train operation, when on February 4 it placed the first of two 5,400-hp. Diesel-electric locomotives, recently built by the Electro-Motive Corporation, in operation between Chicago and California. The addition of these two locomotives brings the number of Diesel-electric locomotives in operation on the Santa Fe to 68, including 23 used in passenger service and 43 in switching service. These 5,400 hp. locomotives are similar to the 5,400-hp. Diesel-electric locomotive which the Electro-Motive Corporation constructed in 1938 and which has been tested in road service by various railroads.

On February 3 the Santa Fe's new locomotive was reviewed by 600 members of the Traffic Club of Chicago, the Junior Traffic Club of Chicago and the Woman's Traffic Club of Chicago, who made an inspection trip to the plant of the Electro-Motive Corporation at La Grange, Ill.

On February 4 members of the press and officers of the railway left Chicago to accompany the new locomotive on its initial run to Los Angeles, Cal.

The new locomotive is 193 ft. long from coupler to



The New Freight Locomotive Was Tested East of Clovis, N. Mex., Prior to February 4

coupler, weighs 464 tons with fuel and sand and has a tractive force of 220,000 lb. at starting. The power plant consists of four 16-cylinder General Motor's two-cycle Diesel engines, a generator directly coupled to each engine and 16 traction motors of which one is located on each of the 16 axles of the eight four-wheel trucks.

It is designed with control cabs high in the nose of each end so as to eliminate turning. It carries 4,800 gallons of fuel, an amount sufficient to haul a 100-car train of 5,000 tons about 500 miles. "Electric retarding brakes,"—the resistances of the axle motors when used as generators—are employed to retard the motion of the locomotive. The current generated by the "reversed" traction motors is dissipated in the form of heat through grids in the roof of the locomotive.

The main exterior body color of the locomotive is Santa Fe dark blue with a 26-in. wide yellow band located on each side of the locomotive and on the front and top of the operator's cab. A 6½-in. yellow stripe also appears along each side sill.

Seat Covering of Box-Woven Plastic

A RECENT development in the field of plastic research is the production of colorful, box-woven Saran seat covers by the Heywood-Wakefield Company, Gardner, Mass. This development has been introduced to the transportation industry by the New York City Board of Transportation which placed in service a subway car equipped with seats covered with this material.

Among the advantages claimed for the seat covers is the ease with which they may be cleaned. Saran is non-porous. The dirt is confined to the surface and cleaning is a simple operation requiring only soap and water. Another advantage is the absence of splitting or cracking in this new material. A major annoyance with fibrous seating materials is the damage done to passengers' apparel, due to cracking and splintering. Because of its toughness, smoothness and flexibility, this plastic eliminates any such damage. It is available in an extensive range of colors.

Saran is the name given to the fabricated forms of a group of new thermoplastic resins, technically known as

vinylidene chloride, produced by the Dow Chemical Company, Midland, Mich. This particular family of plastics, being crystalline in character, has extreme flexibility combined with high tensile strength. Under tests conducted in the Dow laboratories this plastic has been flexed more than 250,000 times without breakage and experimental strands can be produced with a tensile strength as high as 100,000 lb. per sq. in. It is highly resistant to water, corrosive acids, alkalis, inorganic and most organic solvents. It will not burn.

The high quality synthetic rattan is produced by an extrusion process into one continuous strand which



Seats Installed in a New York Subway Car Are Upholstered with Saran, a New Woven Plastic Seat Covering

speeds up the weaving and results in a finer finished material than is possible with the short lengths of natural materials. A contribution by Heywood-Wakefield technicians is the pre-forming of the seat corners after weaving.

New Books . . .

History of the Wisconsin Central, by Roy L. Martin. 170 pages. 9 in. by 6 1/4 in. Bound in paper. Published by the Railway & Locomotive Historical Society, Baker Library, Harvard Business School, Boston, Mass. Price for members, \$1, for non-members, \$2.

The author, who is connected with the Johns-Manville Company, was brought up at Stevens Point, a division headquarters on the Wisconsin Central, started his career in the shops there and later became a fireman and engineman on the road. He was prompted to write it by the interest of a former boyhood chum whose father helped build the road. The publisher of the book is a member of the Society who offered to produce the book "in his own way" in Menasha, Wis., where the W. C. had its inception. An editorial note points out that the book is the product of industries located along the railroad, including the text paper, pictorial paper, engravings, printing and binding. It makes a most impressive volume.

The author—unlike so many amateur historians—has made a real attempt to make his book dramatic and so interweaves the story of the Wisconsin Central with the life and atmosphere of the times that the book is a significant contribution to the history of Wisconsin generally. At times, the attempt to "polish up" the English makes for obscurity, a typical example being, "Thus, Kolze [station on the W. C.] developed and grew to be one of these indispensable strongholds where the strenuous unpolished

phases of railroad freight traffic are ironed out by methodical efficiency, obscure and monotonous in operation, but vital to railroad livelihood."

The history of the Wisconsin Central is taken from its inception in the epic lumber days of Wisconsin (so well described in Edna Ferber's "Come and Get it"), to 1909 when the road was taken over by the Soo. The author does not hesitate to express his opinion about the rascality of the construction company, the history of which parallels that of many "Eastern capitalists" who collected money from ambitious rural districts on vague promises. For the actual operating men and employees of the road, however, he has nothing but admiration and devotes a goodly portion of his work to pictures, biographical sketches, and anecdotes concerning them. The duller details, such as corporate structure, construction records and locomotive roster, are compressed in the rear of the book under separate appendices. Illustrations are copious, well chosen and admirably captioned.

It is hard to believe that the dominant reason for government grants in aid of the road was a desire to have a road of military value north to the Canadian line. In the '60's and '70's Washington was not on the best of terms with Westminster. Another interesting but little-known story told by the book is the unsuccessful attempt of the Wisconsin Central to gain an entrance into Chicago; actually the road built what is now known as Grand Central Station, but was later reduced to paying rent.

An Expert Reports on Union Practices

Some of the decisions of the Railroad Adjustment Board "are among the strangest in the annals of industrial relations." This is the statement not of a "labor-baiter" nor a spokesman for railroad management, but of a noted student of labor policies, who has been highly respected by labor and who, if he can be said to lean one way or the other in his views, has done so in the direction of the labor organizations rather than the contrary. This opinion appears in a 597-page study* of union policies and their effect on industrial management, as well as on the welfare of their members. The author is Dr. Sumner H. Slichter, professor of business economics at Harvard University and an active member of the American Association for Labor Legislation.

This is not "just another book" on labor problems by a college professor. The aim of the study is practical. As originally projected, the work's primary attention is focused on "the policies and attitudes of trade unions with reference to production." It has been expanded to include a wider range of relationship between unions and employers, but the original intention of sticking to definite machinery like shop rules, lay-off restrictions, seniority policies, etc., has been carried out.

To this end the author has placed on the table the fruit of many years of personal contact with labor and management principals. Dr. Slichter is not an armchair scholar. He gets around—as countless quotations in this book from shop foremen, supervisory officers and employees of all ranks bear conclusive evidence. Equally numerous illustrations from little-known industrial history attest also to the breadth of the author's first-hand acquaintance with the things he writes about. This method of presentation not only gives the reader good reason to believe that he is getting facts rather than mere opinions, but it puts the breath of life into the work. The truth is said to be stranger than fiction—

in the hands of a competent writer it can also be more interesting.

The work has an especial interest for railroaders for two reasons: (1) Because, covering labor conditions in all businesses, it gives the railroad reader a basis for comparing conditions on the railroads with those in other industries, with, perhaps, the possibility of getting ideas elsewhere for railroad application. (Thus, for example, railroaders should be interested in the changed attitude of the Amalgamated Clothing Workers from one of "get all you can out of them" to one of industry-promotion by wage concessions, abandonment of restrictive rules and direct assistance to employers in reducing costs and improving quality.) (2) Conditions in the railroad field receive frequent and detailed treatment in the book, and two entire chapters are devoted to discussions of union-management co-operation on the railroads. Further, the author displays familiarity with the problems peculiar to railroading and has had close personal contact with leaders, both of railroad unions and railroad management—among them B. M. Jewell of the A. F. of L.'s Railway Employees department, and Col. G. H. Emerson, chief of motive power and equipment, Baltimore & Ohio.

The volume is easy to read and is classified with simplicity. Union policies and methods of control are grouped separately according to the problems they occasion; i. e., entrance to the trade (apprentices); hiring; layoffs; "make-work"; technological change; how wages should be paid; competition of non-union plants. Following each of these chapters (which are largely informative) there appears a critical discussion of the effects of the union policies on employment, wage levels, and business survival. The closing sections of the book have to do with experiments in union-management co-operation as tried out in the garment trades and on the railroads.

Collective bargaining, the author asserts, presents two separate aspects: (1) as a method of price-making; (2)

* "Union Policies and Industrial Management." Published by the Brookings Institution, Washington, D. C. Price, \$3.50.

as the establishment of a system of "industrial jurisprudence" embodied in rules and practices, rights and duties, adhered to by labor and management. It is the latter aspect with which the book deals. A few of its broader observations in the field generally will illustrate the scope of its inquiry:

Problem of Competition.—"The success of unions and employers in developing a system of industrial jurisprudence which is adapted to constantly changing conditions will depend partly upon the extent to which both parties are market-minded—that is upon how carefully they consider the effect of working rules and labor costs upon the volume of employment in the plant or industry. . . . When management itself does not promptly translate savings of labor costs into attempts to obtain a larger volume of sales (and hence to bring more jobs into the plant), unions cannot be expected to become market-minded and to be interested in the relationship between labor costs and the volume of employment."

"Although as a general rule the national officers of unions are more willing than either local officers or the rank and file to help union employers to meet competition, this generalization is open to a few exceptions. . . . The national officers of the railroad transportation brotherhoods have opposed special concessions to certain weak roads (or special trip rates on branch lines), although these concessions would have assisted in limiting the shrinkage of railroad employment. They feared that concessions made on weak roads would spread to strong ones."

Make-Work Rules.—"Makework rules are likely to be paid for by wages lower than the union could otherwise obtain, because the disadvantages which the union can afford to impose on employers are limited."

"From the standpoint of the community, make-work rules are a wasteful way of dealing with the unemployment caused by intermittent work, technological change, and market shifts. . . . They simply draw into the industry more men than are needed and thereby reduce the capacity of the industry to give a high standard of living to its employees."

"Make-work rules are a dangerous expedient for dealing with the unemployment which occurs in declining industries or as a result of market shifts. . . . If the demand for labor in the industry is elastic, the make-work policy, by raising labor costs, only makes a bad situation worse. Even when the immediate demand is inelastic, the demand over a period of two to three years (the time required for employers and their customers and competitors to make various adjustments in their operations) is likely to be elastic. Consequently, in the case of declining industries or market shifts, make-work rules are almost certain to aggravate the very problem that they are intended to alleviate."

Obsolete Rules and Agreements.—"It is important to explore carefully all the probable consequences of each prospective rule. The ultimate consequences may be very different from the immediate ones because the intermediate or long-term elasticity of the demand for labor is usually much greater than the immediate elasticity. Unions which fail to notice this difference and which base their policies on wrong assumptions concerning the elasticity of the demand for labor may hurt their members instead of helping them. At least in such cases the union policies may leave the members of the union as a group worse off, though the majority who retain their jobs may be better off."

In discussing the railroads, Dr. Slichter is critical of both labor and management. He looks particularly askance at wage rules, blaming the unions for their opposition to a change of "the obsolete definition of a day's work of fifty years ago" which "keeps in railroad service many thousands of men who are not needed there," and chiding management for its failure when the eight-hour day was established to "take advantage of the opportunity to trade a reduction of the day in hours for an increase in the day in miles."

He expresses the belief that the failure of the railroad unions to accept changes which would better enable the roads to compete may depend in part on the unwillingness of management to pursue a similar policy by lower-

ing rates and giving fast and frequent service. The roads have elected "to seek compensation for their loss of business by endeavoring to obtain higher rates on certain products. The unions have pursued the same policy: they have attempted to gain compensation for the loss of jobs by a shorter working day without a reduction in pay."

Dr. Slichter severely criticizes some of the decisions which have come from the Railroad Adjustment Board set-up. He is especially sharp on its policy of "reading property rights in work into the agreements" illustrated by yard-vs.-road-crew rulings—an "amazing interpretation of the seniority rule." The Adjustment Board, he says, holds that once a yard has regularly been established it can be abolished only with the consent of the union and that in the meantime the holders of seniority rights in the yard crew are entitled to compensation for all yard work. "It logically follows from these decisions," he goes on to say, "that in the event of an increase in traffic, the roads could not establish yards and start yard crews at new points without the consent of the unions because that would be depriving road men of part of their work!"

The two chapters devoted to union-management cooperation describe in detail its workings on the two roads which pioneered the scheme and have continued it to the present—the Baltimore & Ohio and the Canadian National.

The Rails Push West, by Marian McIntyre McDonough. 304 pages. 8½ in. by 5¾ in. Bound in cloth. Published by the Penn Publishing Company, Philadelphia, Pa. Price, \$2.00.

Railroad public relations officers in search of material of interest to young Americans and railroad men with adolescents in the home will appreciate this excellent "popular juvenile" novel. It is of standard size and character of its class, using as its material the historic battles between the Santa Fe and the Rio Grande for possession of Raton Pass and the Royal Gorge of the Arkansas River. The heroine, the 14-year-old daughter of a Santa Fe construction engineer, plays an important, though fictitious, part in the proceedings and jumps hurriedly from wild rides in engine cabs to courageous dealings with striking laborers. The book plays havoc with history—the little D. & R. G. is a kind of sinister force, and, contrary to actual events, loses the fight for the Royal Gorge—but no harm done; atmosphere and details are as authentic as can be expected. The fly leaf says the book is for girls from 12 to 16, but boys of the same age who can put up with girls as heroines ought to enjoy the railroad atmosphere of the piece.

Cable Car Days in San Francisco, by Edgar M. Kahn. 124 pages. 10 in. by 7 in. Bound in cloth. Published by the Stanford University Press, California. Price \$3.

This delightful book tells how the hills of San Francisco were conquered mechanically by tiny rail cars pulled by an underground wire rope, a form of local transit which helped a number of large cities bridge the gap between animal and electric traction. Gone elsewhere, the gripman's bell still tinkles on the steeper arteries of the big Pacific port.

The author is undoubtedly a professional writer—if he isn't he ought to be—and tells the tale with humor, charm and scrupulous accuracy. In the case of the California Street Cable road he has done a great deal of original research through the records of the company and in conversations with employees and its 86-year-old president. This corporation was one of the proudest achievements of the famous builders of the Central Pacific—Stanford, Hopkins and Crocker—and was instrumental in promoting the phenomenal growth of the city. Rare illustrations accompany the text. Drawings in the manner of the Nineties head the chapters and line the covers.

NEWS

Roads Will Reject High Scrap Bids

P. R. R. and Central to sacrifice scrap bids held high by Defense Council

The Pennsylvania, New York Central and several other eastern roads have created an unexpected stir in the markets of iron and steel scrap by warning scrap dealers that they will not accept bids which the Price Stabilization Division of the President's National Defense Council considers too high. The first notice was issued by the Pennsylvania on January 30 in connection with inquiries for bids on 23,997 tons of iron and steel scrap to be sold February 6 and took the form of a clause inserted in all invitations to dealers for bids which read as follows:

"In conformity with our policy in co-operating with the National Defense Council on Price Stabilization any prices out of line with the publicly expressed desire of that Commission to prevent unduly high prices will be rejected."

In a previous sale the Pennsylvania had rejected one or more bids of dealers quoting prices above the value which the government said scrap should be sold to steel producers. This action by the Pennsylvania was taken at the request of the Price Stabilization Division of the National Defense Council, and, following the Pennsylvania's announcement, dealers of the railroad scrap received similar notices from the New York Central and other roads in the east.

In purchasing commodities and equipment from dealers, railroads have always reserved the right to reject bids which were too high and they have regularly reserved the right to reject offers from scrap dealers which they considered too low, but this is the first time since this country was an actual participant in the World War that railroads have taken the position that they would reject quotations from responsible scrap dealers because they were "too high."

This action has created confusion in the scrap market, principally because maximum prices have not as yet been established for each class of scrap in each district and many scrap dealers are at a loss to know what prices they may bid to obtain tonnage they require to fill previous as well as future contracts with their customers. The National Defense Council insisted that the price of No. 1 heavy melting steel should not exceed \$24.50 per gross ton at Pittsburgh in December, and this was reduced to \$22 a ton in January and \$21 in

February, but scrap dealers take the position that these prices were maximum prices to be charged consumers in that district—not necessarily the prices which the scrap dealer could pay for scrap they purchased from scrap producers for sale in the same or other districts.

While this action has been taken by a number of railroads in the east, reports that the A. A. R. has recommended it as universal practice or that all of the railroads have concurred in the practice have been denied, and numerous railroads are said to be definitely opposed to such a step at this time. On January 22 a special committee of the Purchases and Stores Division, A. A. R., met in Washington with the director and assistant director of the Price Stabilization Division of the National Defense Council, during which the committee offered to cooperate with the government in stabilizing prices and sought to determine how the railroads could cooperate without jeopardizing their own interests. During the discussion it was pointed out that the railroads would prefer lower prices of scrap than higher prices of finished steel, but no definite steps were agreed upon at the time and it is understood that the action which has been taken since that meeting reflects the independent action of each railroad.

Chicago Railway Women to Banquet on February 15

The Railway Business Woman's Association of Chicago will hold its fifteenth annual banquet on February 15. Robert S. Henry, assistant to the president of the Association of American Railroads, will be the guest speaker.

Yucatan Government Takes Back Railroads

The United Railways of Yucatan, which for a number of years has been under the management of the Union of Employees, has been taken back by the government, the majority stockholder. Governor Echeverria has contended that neither the lines nor the workers have benefited by the experiment.

Harriman to Speak at Washington Traffic Club's Annual Dinner

W. A. Harriman, chief, Industrial Materials, Office of Production Management, and chairman of the Union Pacific board of directors, will be the speaker at the annual banquet of the Traffic Club of Washington, D. C., to be held at the Mayflower Hotel in that city on February 13. Judge R. V. Fletcher, vice-president and general counsel of the Association of American Railroads, will act as toastmaster.

Commission Gets New Controversy

Labor and management ask it for an interpretation of Harrington amendment

The question of what the Transportation Act of 1940's Harrington labor-protection amendment which now constitutes Section 5(2) (f) of the Interstate Commerce Act, means was thrown squarely in the lap of the Interstate Commerce Commission on February 5 when that body heard oral argument in Finance Docket No. 12460, the lease of the Fort Worth & Denver City and the Wichita Valley by the Colorado & Southern. After hearing the subject discussed both pro and con by counsel for the railroad and for the Railway Labor Executives Association and the Brotherhood of Railway Clerks, it appeared that most of the members were in considerable of a quandary as to its proper interpretation and that considerable time would have to be spent in working out an interpretation suitable to both sides.

The views of railway labor were set forth in a brief filed last month, details of which were given in the *Railway Age* of January 25, page 225. During the argument it became evident that the railroad and railway labor differed very materially on one fundamental proposition, that of whether the Washington job-protection agreement was still in effect, or whether the Harrington amendment has superseded it. Walter McFarland, assistant general counsel for the Chicago, Burlington & Quincy, which controls the Colorado & Southern, took the latter position, while Willard H. McEwen and Horace Bacus, co-counsel for the R. L. E. A. and the Clerks, maintained that it was still in effect and could be used as a starting point for drafting new conditions under the Harrington amendment.

On the question of the conditions to be laid down by the commission, there seemed to be some difference of opinion between the two labor counsel as to whether they wanted the four-year provision to run from the time that the commission's order went into effect, with the men to be displaced receiving a cash payment of four years' wages and dismissal or whether they would be willing to have the merger postponed for four years and the men receive a four-year notice that they would be let off. It appeared that Mr. McEwen took the former position while Mr. Bacus took the latter. Questions from the bench did not clear up this point.

From the argument of Mr. McFarland one received the impression that the railroad would be willing to give the men a four-year notice, but keep most of them, at least, on the job and thus defer the benefits of the consolidation for the four-year period. If a man were immediately laid off, he would be paid a monthly wage for the next four years, but if he were offered a job on the railroad, he would be compelled to either take it, or forego his monthly allowance, which would be one-twelfth of his previous annual wage. Mr. McFarland submitted an additional set of conditions, which generally follow those set out in the Washington Agreement and those laid down by the commission in the so-called Rock Island lease case of a year or so ago.

During Mr. McFarland's initial argument in which he set out the benefits which would accrue to the C. & S. by taking over the F. W. & D. C. and the W. V. and closing the Fort Worth accounting offices and some of the shops in Childress, Tex., Chairman Eastman asked him why the C. & S. didn't consolidate the two lines and call them the Fort Worth & Denver City. Mr. McFarland couldn't answer this question, but he did say that he felt the lease method as opposed to outright consolidation would be quicker, and he added that the two roads may eventually be consolidated and called the Fort Worth & Denver City.

Mr. McFarland told the commission that under the new language in the Transportation Act of 1940, the railroad had to prove that the lease was "consistent with the public interest," while the earlier act had required that it "promote the public interest." The new language, he said, would require a lesser degree of proof than the former. He also confessed that he did not know what the language of the Harrington amendment means, but he did think that it had superseded and abrogated the Washington Agreement.

E. P. Byers, representing the Fort Worth Chamber of Commerce and the Fort Worth Freight Bureau, asked the commission to deny the application, asserting that the alleged savings of some \$300,000 a year could not be achieved. He warned the commission that the local shippers in Texas would retaliate by routing their shipments over other railroads and over motor carriers if the merger is carried through. He referred briefly to a letter written to him by Chairman Eastman in which the latter had objected to the language used by the Texas interests in a communication to him to the effect that reprisals would result if the merger was carried out. "This was not a threat, Mr. Chairman," he asserted, "it was just a natural reaction."

At one point in his argument Mr. Byers declared that the freight now handled by the Fort Worth & Denver City would be routed by trucks if the merger is consummated. "That might be in the public interest," observed Commissioner Aitchison. "We're also the guardians of the trucks, you know."

C. C. Broughton, representing the Childress, Tex. Chamber of Commerce, took the same position, saying that his city had under-valued the property of the railroad

by some 75 per cent for tax purposes as compared with other property in the county. He felt that the petition should be denied as it would ruin the town and throw many men out of jobs and onto relief.

C. C. Rotsch, counsel for the State of Texas and the Railroad Commission of Texas, warned the commission that the legislature is now in session and that there is a good chance that the load-limit law for trucks will be raised if this merger is put through. He also asked the commission to respect the law of Texas which provides that all railroads in Texas must be incorporated there and maintain their shops and offices in that state.

The final Texas witness in opposition to the merger was A. G. Carter, Fort Worth publisher, who has been active in the opposition movement. He maintained that the diversion of traffic which will result will more than offset any savings which the railroad may effect. He told the commission that he had incorporated in his last will and testament an admonition to his 21-year old son, who is going to take over his interests, to always be on the alert for injustices on the part of the Burlington and continue reprisals against the railroad if it takes its offices out of Texas. He closed by saying that Ralph Budd, president of the Burlington and the Fort Worth line, had underestimated the resentment of the Texans.

1940 Net Railway Operating Income Was \$682,118,487

Class I railroads of the United States in 1940 had earnings [net railway operating income] of \$682,118,487 before interest and rentals, according to the Bureau of Railway Economics of the Association of American Railroads. This was at the annual rate of return of 2.61 per cent on their property investment. The corresponding earnings in 1939, before interest and rent-

ments alone the tax bill amounted to \$26,740,116, an increase of \$2,513,416 or 10.4 per cent above December, 1939. Sixteen Class I roads failed to earn expenses and taxes in 1940, of which six were in the Eastern district, four in the Southern district, and six in the Western district.

The December, 1940, net railway operating income of the Class I roads was \$78,790,679 or 4.27 per cent on investment compared with \$60,981,299 or 3.31 per cent in December, 1939, and \$48,505,431 or 3.06 per cent in December, 1930. Gross for December amounted to \$381,791,527, compared with \$345,180,252 in December, 1939, and \$373,652,000 in December, 1930; operating expenses totaled \$266,134,183, compared with \$249,006,533 in the same month in 1939, and \$294,575,875 in December, 1930.

Class I roads in the Eastern district had a net in 1940 of \$376,024,679, a return of 3.1 per cent; in 1939, their corresponding earnings were \$331,120,745 or 2.73 per cent, and in 1930 they were \$438,492,623 or 3.75 per cent. Gross in 1940 in the Eastern district totaled \$2,152,455,100, an increase of 9.4 per cent compared with 1939, but a decrease of 17.8 per cent compared with 1930. Operating expenses totaled \$1,506,578,764, an increase of 7.9 per cent above 1939, but a decrease of 22.9 per cent under 1930. The December, 1940, net in the Eastern district was \$40,800,271, compared with \$34,567,186 in December, 1939, and \$21,936,644 in December, 1930.

In the Southern district the 1940 earnings, before interest and rentals, totaled \$81,939,907, a return of 2.57 per cent; in 1939 the corresponding earnings were \$79,592,778, a return of 2.51 per cent, and in 1930 they were \$88,405,629 or 2.68 per cent. Gross in 1940 of the Class I roads in the Southern district amounted to \$545,276,355, an increase of 6.5 per cent compared with 1939, but a decrease of fifteen per cent compared with 1930; operating ex-

CLASS I RAILROADS—UNITED STATES

Month of December

	1940	1939	1930
Total operating revenues	\$381,791,527	\$345,180,252	\$373,652,000
Total operating expenses	266,134,183	249,006,533	294,575,875
Taxes	26,740,116	24,226,700	19,891,622
Earnings before charges	78,790,679	60,981,299	48,505,431
Operating ratio—per cent	69.71	72.14	78.84
Rate of Return on property investment	4.27	3.31	3.06

Twelve Months Ended December 31

	1940	1939	1930
Total operating revenues	\$4,296,600,473	\$3,995,004,243	\$5,280,234,535
Total operating expenses	3,089,474,191	2,918,209,705	3,931,043,991
Taxes	396,353,538	355,677,557	348,536,962
Earnings before charges	682,118,487	588,829,077	868,719,483
Operating ratio—per cent	71.91	73.05	74.45
Rate of Return on property investment	2.61	2.26	3.36

als, were \$588,829,077 or 2.26 per cent, and in 1930 were \$868,719,483 or 3.36 per cent on property investment.

Gross operating revenues in 1940 totaled \$4,296,600,473, compared with \$3,995,004,243 in 1939, and \$5,280,234,535 in 1930, an increase of 7.5 per cent in 1940 above 1939, but 18.6 per cent below 1930. Operating expenses amounted to \$3,089,474,191, compared with \$2,918,209,705 in 1939, and \$3,931,043,991 in 1930—5.9 per cent more than the former, but 21.4 per cent below 1930.

Class I roads in 1940 paid \$396,353,538 in taxes, compared with \$355,677,557 in 1939, and \$348,536,962 in 1930. For De-

cember totaled \$404,502,835, an increase of seven per cent above 1939, but a decrease of 19.6 per cent under 1930. Class I roads in the Southern district for December had a net of \$12,177,295, compared with \$8,680,183 in December, 1939, and \$8,768,588 in December, 1930.

Class I roads in the Western district in 1940 had earnings of \$224,153,901, before interest and rentals, a return of 2.08 per cent. In 1939 their corresponding earnings were \$178,115,554, or 1.66 per cent, and in 1930 the comparable net railway operating income was \$341,821,231 or 3.14 per cent. Gross in the Western district in 1940

amounted to \$1,598,869,018, an increase of 5.6 per cent above 1939, but a decrease of 20.8 per cent below 1930; operating expenses totaled \$1,178,392,592, an increase of three per cent compared with 1939, but a decrease of 20.1 per cent compared with 1930. For December alone the Class I roads in the Western district had a net of \$25,813,113, compared with \$17,733,930 in December, 1939, and \$17,800,199 in December, 1930.

Beyer Confirmed for National Mediation Board

The Senate on January 31 confirmed President Roosevelt's reappointment of Otto S. Beyer as a member of the National Mediation Board for a new three-year term expiring February 1, 1944.

Exemption of Motor Carriers Operating on Intrastate Routes

The Interstate Commerce Commission, Division 5, has prescribed forms for the filing of applications for exemption from regulation of motor carriers engaged in interstate commerce but operating on routes wholly within one state. The exemption provisions were a part of the Transportation Act of 1940, and are in section 204(a) (4a) of the Motor Carrier Act. The application is Form B. M. C. 72.

Bank to Put Branch in Station for Commuters' Convenience

A small branch office for the convenience of commuters is to be installed in the waiting room of the New Rochelle (N. Y.) station of the New York, New Haven & Hartford by the First National Bank of that city. The branch will occupy a 5 ft. by 7 ft. space in the corner of the waiting room now occupied by a bootblack stand. Grilled windows will be installed and one or two tellers will be on duty from about 7:30 a. m. until after 11 a. m. to transact all general banking business.

New York Model Club to Put on Big Exhibition

The New York Society of Model Engineers will hold its 13th annual exhibition at 152 West 42nd street, New York, February 7 to 22, inclusive. The exhibition features the largest model railroad in the world, comprising 5,000 ft. of 1.25-in., O-gage track and complete signal and control circuits which duplicate actual practice (they comprise 48,000 ft. of wire and cable). The model system uses for the first time a scale steel rail, an exact 1/45th size duplicate of the latest 150-lb. rail section.

"Fan" Activities

Sidney Withington, electrical engineer, New York, New Haven & Hartford, will address the New York division of the Railroad Enthusiasts in Room 2728, Grand Central terminal, New York, on February 28, discussing the history of the New Haven system. The railroad's sound film, "This Is New England," will be projected following his talk.

The Dearborn Chemical Company will show its film entitled "Locomotive Boiler Water in Action" before the Philadelphia (Pa.) division of the Railroad Enthusiasts,

Inc., in the Pennsylvania Suburban Station building on February 14.

Club Meetings

The Central Railway Club of Buffalo will hold its next meeting at the Hotel Statler, Buffalo, N. Y., on February 13. J. K. Baylis, Buffalo manager of sales, Bethlehem Steel Company, will introduce the company's new motion picture "Streamlined Steel," which tells the story of rolling sheet and strip steel by the continuous process method. The Central Railway Club chorus will present a program of entertainment.

The Traffic Club of Philadelphia, Pa., will hold its annual meeting and luncheon at the Benjamin Franklin hotel, Philadelphia, on February 10, at 12 noon.

R. D. Rupp, supervisor regional expenditures, Pennsylvania, Philadelphia, Pa., will discuss "Practical Suggestions in Public Speaking" before the Delta Nu Alpha transportation fraternity at the Y. M. C. A., Wilmington, Del., on February 12. The fraternity was formed recently by the members of the traffic course sponsored by the Traffic Club of Wilmington and will foster a program of study in traffic matters.

Carriers Amend Fourth-Section Relief Petition

The Association of American Railroads and the American Short Line Railroad Association have asked the Interstate Commerce Commission for leave to amend the recently-filed petition wherein the railroads are seeking blanket relief from the long-and-short-haul clause in order to simplify the publication of tariffs to cover situations where departures are caused by circuitous rail and rail-water routes rather than by competing water lines. The proposed amendment to the application would stipulate that the relief would apply "only with reference to routes of similar constituency; that is to say, all-rail routes to be authorized to meet the rates only of other all-rail routes, and only rail-and-water routes to be authorized to meet the rates of other rail-and-water routes."

The filing of the original application, which has been docketed as Fourth Section Application No. 18830, was noted in the *Railway Age* of January 4, page 122.

Court Sustains B. & O. Tax Immunity

The Maryland Court of Appeals has sustained a ruling of the state Circuit Court holding that the terms of its original charter exempts the Baltimore & Ohio from Baltimore city and county taxation. The State Tax Commission had appealed the Circuit Court order overruling its \$4,131,245 assessment of a portion of B. & O. rolling stock for taxation for 1934, contending that since the lines acquired by the road since its original charter were taxable, the rolling stock necessary for the operation of such lines is also subject to such taxation.

Radio Dramatizes Career of A. H. Wright

Incidents in the career of A. H. Wright, who became vice-president and general manager in charge of operation of the

New York Central lines Buffalo and east on January 1, were dramatized over the nation-wide network of the Columbia Broadcasting System on the evening of Monday, February 3. Professional actors portrayed various incidents in Mr. Wright's upward climb in the railroad business; Mr. Wright himself said a few words at the close of the program in conversation with Commentator John B. Kennedy. The broadcast was one of a series entitled "The March Through Life."

Conference on Rules for Transport of Explosives

Because it has received several applications for early action on proposed modifications of the new regulations for the transportation of explosives and other dangerous articles, the Interstate Commerce Commission's Bureau of Service has called an informal conference of interested parties to be held in Washington, D. C., on February 20. The new regulations became effective on January 7.

The notice of the conference lists several proposed changes in the regulations which will come up for "informal discussion." The invitation to attend has been extended to parties of record in No. 3666 proceeding out of which the new regulations came.

How to Guard Against Sabotage

A handy 56-page book entitled "Sabotage—How to Guard Against It" has recently been published by the National Foremen's Institute, New York and Chicago, price \$1. The author—H. D. Farren—does a good job of driving home the importance of sabotage efforts here in the last war and the methods used.

Although the book does not deal to any extent with specific plans for combating sabotage, it will arouse interest in the problem and contains some pungent paragraphs that may well be passed along to workers and supervisors as "pep talk." It also reprints information recently released by the War Department to munitions industries concerning desirable plant construction, protection and employee precautions.

Land-Grant-Claim Releases

Approval of land-grant-claim releases submitted by the Great Northern, New York Central, Michigan Central and Chicago, St. Paul, Minneapolis & Omaha, under which those roads may take advantage of the Transportation Act of 1940's land-grant-rate-repeal provisions, has been announced today by Secretary of the Interior Harold L. Ickes.

The release of the Great Northern covers land-grant territory traversed by its predecessor, the St. Paul, Minneapolis & Manitoba, which had succeeded to the land-grant railroad owned by the St. Paul & Pacific. The area embraced the main line from Stillwater, Minn., by way of St. Paul to Breckenridge, Minn.; the Brainerd branch from Minneapolis by way of East St. Cloud to Watab, Minn., and the St. Vincent extension from East St. Cloud to St. Vincent, Minn., with a branch to the international boundary line at Noyes. The New York Central release covers a land-grant road of its predecessor, the Amboy,

Lansing & Traverse Bay, between Lansing and Jonesville, in Michigan. The Chicago, St. Paul, Minneapolis & Omaha release covers a small portion of the main line of its predecessor, the St. Paul & Pacific, east from St. Paul to Stillwater, Minn. The Michigan Central release covers territory of its predecessor, the Jackson, Lansing & Saginaw from Lansing by way of Owosso and Bay City to Mackinaw City, Mich.

Freight Car Loading

Loadings of revenue freight for the week ended February 1 totaled 714,323 cars, the Association of American Railroads announced on February 6. This was an increase of 3,571 cars, or 0.5 per cent, above the preceding week, an increase of 56,493 cars, or 8.6 per cent, above the corresponding week last year, and an increase of 141,196 cars, or 24.6 per cent, above the comparable 1939 week.

As reported in last week's issue, the loadings for the previous week ended January 25 totaled 710,752 cars, and the summary for that week, as compiled by the Car Service Division, A. A. R., follows:

Revenue Freight Car Loadings			
For Week Ended Saturday, January 25			
Districts	1941	1940	1939
Eastern	158,955	151,216	134,993
Allegheny	157,415	140,736	113,599
Poahontas	47,847	47,898	42,619
Southern	110,864	93,414	93,990
Northwestern ..	81,027	76,819	68,462
Central Western ..	101,833	97,039	93,084
Southwestern ..	52,811	43,065	43,712
Total Western Districts	235,671	216,923	205,258
Total All Roads	710,752	650,187	590,459
Commodities			
Grain and grain products	30,772	30,395	32,199
Live stock	10,940	11,200	12,966
Coal	154,533	172,399	136,763
Coke	13,614	13,273	8,165
Forest products ..	39,008	27,815	27,917
Ore	12,431	8,830	7,640
Merchandise l.c.l.	149,862	143,370	146,436
Miscellaneous ..	299,592	242,905	218,373
January 25	710,752	650,187	590,459
January 18*	703,497	646,382	586,656
January 11	711,675	668,241	582,244
January 4	614,171	592,925	529,371
Cumulative Total, 4 Weeks	2,740,095	2,557,735	2,288,730

* Corrected figures.

In Canada.—Carloadings for the week ended January 25 totaled 52,085, as compared with 51,324 in the previous week and 50,077 a year ago, according to the summary of the Dominion Bureau of Statistics.

	Total Cars Loaded	Total Cars Rec'd from Connections
Total for Canada:		
January 25, 1941	52,085	27,756
January 18, 1941	51,324	27,103
January 11, 1941	51,703	26,764
January 27, 1940	50,077	24,341

Cumulative Totals for Canada:		
January 25, 1941	198,248	106,040
January 27, 1940	184,926	93,669
January 28, 1939	158,307	83,479

N. Y. R. R. Club Meeting to Feature Locomotive Boiler and Fire Box

Films illustrating activities in the locomotive boiler and fire box will be presented at the next meeting of the New York Railroad Club, to be held in the Engineering Societies building, 33 West 39th street, New York, on Thursday, February 20. S.

C. Johnson, assistant vice-president, Dearborn Chemical Company, will present a talk entitled "The Behavior of Steam and Water in a Locomotive Boiler," illustrated by motion pictures of a boiler interior taken from the dome of a locomotive operating in fast freight service on the Missouri Pacific. There will also be shown a motion picture entitled "What Happens in a Locomotive Fire Box?" which records views hitherto not available. Introductory remarks and accompanying explanatory comment will be made by A. A. Raymond, superintendent fuel and locomotive performance, New York Central.

Transport Activities of U. S. Chamber of Commerce

The Transportation and Communication Department Committee of the Chamber of Commerce of the United States has reported to the Chamber's Board of Directors on "a heavy docket of current problems," according to the latest issue of the Chamber's "Washington Review." The report was made at the January 24 meeting of the Board in Chicago.

Among other things, the transportation committee cited "new opportunities given the railroads by the Transportation Act of 1940 to effect economies through consolidation." The labor-protection provisions, it added, "while delaying the full benefits of consolidations, should not prevent their being undertaken." Meanwhile, the committee called for prompt settling of the status of forwarders by Congress; and until that is done it favored holding up those outstanding Interstate Commerce Commission orders which, unless further postponed, will require the discontinuance of joint arrangements between forwarders and motor carriers on February 28.

Dealing with share-expense travel bureaus, the committee recommended steps designed to bring about more effective federal regulation and more stringent local supervision. The Committee on Natural Resources Production opposed the setting up of regional power authorities, citing specifically the proposed St. Lawrence development.

Railroads Are Prepared

It is not surprising that those who are bearing the responsibility of national preparedness are showing no concern over the ability of our transportation system as a whole, and especially the railroads, to meet any demands that may reasonably be made on them, according to Elmer T. Howson, vice-president and western editor of the *Railway Age*, in an address before the Transportation Club of Springfield, Ill., on January 30. "In the 20 years since the last war," Mr. Howson said, "our railways have expended \$10,000,000,000 for the improvement of their facilities. This vast sum has been devoted to the perfecting and enlarging of existing facilities rather than to the building of new lines. Some of this money has gone for new locomotives, with the result that, while the number of locomotives has decreased 33 per cent, their average tractive power has increased 43 per cent, and is now the highest in history. Likewise, while the number of freight cars has declined 28 per cent, the

capacity of the average freight car has increased 20 per cent, the average speed with which that car travels in trains has increased 62 per cent and the net ton miles per freight-car day, the measure of traffic output, has increased 36 per cent. Rather than providing less transportation facilities than in 1918, the railways are now prepared to render more transportation service and to handle more traffic than ever before.

"We must also recognize that in the more than two decades since our last war, other agencies of transportation have been developed which share this burden to some extent. Among these, we now have a network of more than 1,000,000 miles of surfaced highways, over which some 5,500,000 trucks are now carrying about 9 per cent of our freight traffic. We have more than 100,000 miles of pipe lines carrying petroleum products and natural gas, accounting for 14 per cent of our national freight traffic. And our inland waterways, including the Great Lakes, have now been developed to the point where they are carrying 14 per cent of our freight traffic. All these facilities are available, if needed, to share in handling peak loadings.

"Still another factor of large importance in increasing the traffic-handling capacity of the railways has been the creation of the regional advisory boards. Organized first in 1924 to develop closer co-operation between shippers and the railways in the use of transportation facilities, these organizations have been of incalculable value in promoting more efficient use of railway facilities by shippers, and their co-operation has contributed greatly to the improvement in efficiency demonstrated by the railways in recent years.

"While considering the ways in which the transportation agencies, and especially the railways, have prepared to meet today's requirements and those of the immediate future, it will be well to consider the magnitude of these demands. In other words, how large is this defense load?

"This has been answered in various ways. Turning back to the experience of the World War, the total increase in traffic, both civil and military, from the year 1916, when we were not at war, to 1918, when we were at war, was only about 12 per cent of the total commercial load. More recent studies of the traffic to be expected from expenditures now being made and contemplated show that the added traffic created thereby should not exceed 10 per cent. And this increase will occur gradually."

Talented Engineman Prevents Spill Off Embankment

By keeping his throttle open and continuing to pull derailed cars slowly against the brake-drag they created, a quick-thinking engineman probably prevented a serious spill down a 15-ft. embankment into a swamp. On January 30, engineman Frank Sheridan was at the head-end of a nine-car commuters' train bound from Boston, Mass., to Plymouth on the New York, New Haven & Hartford, when, between South Braintree and South Weymouth, he became aware of the derailment of the car immediately behind the locomotive. Sens-

ing the requirements of the situation, he kept his engine pulling slowly until the train was brought to a stop by the drag of the derailed equipment—with all cars upright and no passengers injured. Had he shut off and "wiped the clock," one or a number of the careening cars might have toppled off the steep embankment.

Passengers in the last two cars praised Flagman Samuel T. Donald, who, when the cars first bumped off the rails, cautioned all passengers to remain seated and prevented them from rushing for the doors. The cause of the derailment was a broken rail.

Burlington Inaugurates Chicago-Kansas City Trailer-Ferry Service

The Chicago, Burlington & Quincy inaugurated trailer-ferry service between Chicago and Kansas City, Mo., on January 8. Under the plan of operation a newly organized company, the National Transport Company, has made arrangements with truckers operating between and in the two cities, whereby National, which provides facilities for loading and unloading trailers on and off flat cars, will move the trailers over the Burlington. This entire door-to-door truck service by truck and rail is covered in a tariff filed by the truck lines with the Interstate Commerce Commission on January 29.

A contract between the Burlington and National provides for a rate of \$48 per loaded trailer of less than 20,000 lb., \$60.20 per loaded trailer of 20,000 lb. to 35,000 lb., and \$72 per loaded trailer of more than 35,000 lb. Two trailers are loaded on each flat car. The rate for empty trailers is \$24.10. The loaded flat cars leave Chicago at 10:30 p. m. and arrive in Kansas City at 4:30 p. m. the next afternoon. Returning they leave Kansas City at 6 p. m. and arrive in Chicago at 1 p. m.

Ditch Diplomacy Discussed in Congressional Record

Representative Gehrmann, "Progressive" of Wisconsin, has been advised "that the agreement with Canada on the St. Lawrence seaway will be signed in the very near future." So he said in an extension of remarks entitled "St. Lawrence Seaway Opposition Is Based on Fear That Is Not Borne Out by Previous Experience," which he inserted in the appendix to the January 29 issue of the Congressional Record.

Mr. Gehrmann, who suffers perhaps from poor eyesight, cannot see "where a single industry would be hurt by completing or deepening 48 miles of the 2,000-mile route." He added: "It is bound to bring increased business to the railroads, because material and supplies of all sorts will have to be shipped into the Great Lakes region when the seaway is completed, and the building of vessels gets into full swing. . . ." In the same issue of the Record, Representative Beiter, Democrat of New York, inserted an article in opposition to the seaway which appeared in a recent issue of the New Orleans Labor Record, an organ of the American Federation of Labor; also, the opposition resolution adopted recently by the Atlantic States Shippers Advisory

Board. Other recent articles in opposition were inserted in the January 31 issue of the Record by Representative Boggs, Democrat of Louisiana.

Representation of Employees

Results of recent elections in representation-of-employees cases on the Richmond, Fredericksburg & Potomac, Indiana Harbor Belt, and Union have been announced by the National Mediation Board.

On the R. F. & P. the sheet metal workers (including molders), their helpers and apprentices, by a vote of 33 to 18, chose the Sheet Metal Workers International Association, operating through the Railway Employees Department, American Federation of Labor, over the Richmond, Fredericksburg & Potomac Railroad Association of Shopmen, which had previously represented the men involved.

On the Union, the Order of Railway Conductors won from the Union Railroad Employees' Association the right to represent yard foremen, helpers and switch-tenders, the vote being 348 to 235. When the O. R. C. invoked the services of the Board in this Union case, the employees involved, with the exception of the switch-tenders, were represented by the now-defeated Association. In the election on the Indiana Harbor Belt the American Railway Supervisors' Association won the right to represent mechanical department foremen or supervisors of mechanics.

Information on Emergency Service for British Railroad Patrons

The "Railway Gazette" (which is continuing to produce its weekly issues without diminution in size or quality, just as though there were no bombs in London) recently described a special information service set up by the London & North Eastern to apprise patrons of service conditions which illustrates the efforts made by the harassed English carriers to give civilian traffic as much comfort as possible. This road has set-up more than 150 "travel information posts" at the larger stores, air raid warden posts and other frequented points in London suburbs.

If train schedules are disrupted or routes blocked by bomb craters or other damage, up-to-the-minute data is telephoned to these posts from the nearest railroad station where an announcement thereof is written in crayon on a bulletin board. When service is normal a poster bearing a Union Jack and the words "Normal Service" is shown. Locations of all such information posts are listed at suburban stations.

Would "Decentralize" the Retirement Board Out of D. C.

Pointing with alarm to the tremendous increase in government employees in Washington, D. C., during the past several years, Representative Dirksen, Republican of Illinois, asked, during debate this past week on the Independent Offices Appropriation bill, why so many federal agencies had to be congregated in Washington and went on to urge decentralization of government functions.

Representative Dirksen took as an ex-

ample the Railroad Retirement Board, which, he said, had over 1,400 employees in Washington and some 896 "scattered around in the 48 states." After pointing out that the function of the board was to get the pay-roll records and the service records of railroad employees, and to determine their annuities and unemployment compensation, Mr. Dirksen asked his colleagues why this agency had to be located in Washington.

"Why is it necessary," he continued, "for the record of every brakeman and engineer and section man from California or Illinois or Michigan to come down here . . . ? Why, the center of railroading is out in the Middle West. That board could be sent to Pittsburgh, it could be sent to Chicago, it could be sent to Kansas City, and its functions would not be impaired, its efficacy would not be destroyed. In fact, such removal would expedite its work. We could lift out of the congested life of Washington probably 1,000 or 1,200 or more people by establishing this agency in the Central West—send them out and give the taxpayers in other sections of the country a chance to share in the fruits and in the beneficences of government."

It should be noted that although the Representative from Illinois used the Railroad Retirement Board as an example, that agency's appropriation was not before the House in the pending bill.

U. S. Supreme Court Orders

Holding that such matters as the challenge of the payment by a packer of stockyard charges in Chicago should be tried before the Interstate Commerce Commission, rather than in the federal district court, the United States Supreme Court on February 3 dismissed a petition of Armour & Co. against the Alton, in which it was charged that the railroad had failed to live up to its common carrier duty by refusing to provide a receiving point for livestock shipments at which extra charges would not have to be paid.

Justice Black, in his decision, points out that the case was instituted after Armour & Co. had demanded that the livestock be delivered to it, and the carrier had ignored this demand and continued its long-standing practice of making delivery at the yards of the Union Stock Yard & Transit Company of Chicago.

The district court in Chicago and the Seventh Circuit Court of Appeals dismissed the complaint, holding the issues involved presented administrative problems, necessitating primary resort to the Interstate Commerce Commission. The Supreme Court, by dismissing the complaint, upheld the action of the two lower courts.

In the course of his decision, Justice Black called attention to the fact that if the case were to be properly decided, many attendant questions such as rates and the historical background of the practices of handling livestock in Chicago would have to be thoroughly looked into, which would necessitate the taking of evidence by an expert body such as the commission. He further pointed out that in a similar case of Swift & Co. versus the Alton, the commission found it necessary to have a trial

examiner conduct extensive hearings, compiling in the process a record of five volumes, 1,147 pages, and numerous exhibits.

In another case of Howard S. Palmer et al., trustees of the New York, New Haven & Hartford, versus the Webster & Atlas National Bank of Boston, the high court decided that although the trustees of the New Haven are operating the properties of the Old Colony and the Boston & Providence for the account of those companies, yet they are not required to pay those roads' share of taxes on the Boston Terminal out of the funds of the New Haven.

A district court decision had held that the trustees of the New Haven were not obliged to pay the taxes, while the Circuit Court of Appeals took the opposite view. The decision of Justice Roberts has the effect of sustaining the lower court. In his decision Justice Roberts argued that to force the trustees of the New Haven to pay the taxes out of its funds would negate any theory of operation of the Old Colony and the B. & P. by the New Haven for the respective accounts of the trustees of the two companies and, in effect, it would mean that the trustees of the New Haven, who had disaffirmed the leases of the two subsidiaries, would actually be operating them directly as a part of the New Haven.

Highway Rights Incomplete Until Exercised, Says Examiner

Finding that an arrangement for the operation of a highway service under contract does not become a transaction subject to the lease or contract-to-operate provisions of the Interstate Commerce Act's section 5, until the creation of the underlying operating rights is made complete by the exercise thereof, Examiner James L. Smith of the Bureau of Motor Carriers' Section of Finance has recommended in a proposed report that the Interstate Commerce Commission dismiss an application of the Public Service Interstate Transportation Company for authority to operate certain bus services proposed by the New York, Susquehanna & Western. The routes involved are between Butler, N. J., and North Hawthorne, 18 miles, for which the Susquehanna obtained rights from the commission in an order dated July 5, 1939; and between North Bergen, N. J., and New York for which the railroad's application is still pending.

The railroad entered its arrangements with Public Service because it felt that it would thereby be able to provide the highway service more economically than it could by setting up its own bus-operating organization. Public Service's application with respect to the proposed North Bergen-New York route, Examiner Smith would dismiss as premature in view of the fact that the railroad application in that connection has not yet been acted upon. As for the Butler-North Hawthorne service he took a position holding that "until the railroad affirmatively elects to exercise the authority and evidences such election by physical operations, the creation of the operating rights is incomplete." Thus, the proposed report said in closing, "the examiner is of the opinion that the unexercised permissive authority . . . for the

railroad to institute motor bus operations does not constitute 'property' within the meaning of that word as used in section 5. . . ."

Bills in Congress

Several bills to liberalize the Railroad Retirement Act and the Railroad Unemployment Insurance Act have been introduced in the House of Representatives by Representative Van Zandt, Republican of Pennsylvania. They are: H. R. 2845, to extend the crediting of military service under the Retirement Acts; H. R. 2846, to amend the Unemployment Insurance Act with respect to registration for claims; H. R. 2847, to amend the Retirement Act to provide retirement after 30 years of service and attaining the age of 60 years with full annuities; H. R. 2848, to amend the Retirement Act so as to provide for payment of benefits with respect to the month in which an annuitant or pensioner dies; H. R. 2849, to amend the Retirement Act to provide annuities for individuals who are totally and permanently disabled and have completed 20 years of service.

Representative Thill, Republican of Wisconsin, has introduced H. R. 2957, to amend section 77 of the Bankruptcy Act to make claims for personal injury to employees and other preferred claims in railroad reorganization proceedings.

Representative Jennings, Republican of Tennessee, has introduced H. R. 3024 to amend the Railroad Retirement Act's definition of "years of service."

Senator Truman, Democrat of Missouri, has introduced S. 699 to prohibit the operation of motor vehicles in interstate commerce by unlicensed operators.

Senator Guffey, Democrat of Pennsylvania, has introduced Senate Joint Resolution 32 to extend the provisions of the Bituminous Coal Act of 1937 for a period of two years after April 26, 1941.

Representative McGehee, Democrat of Mississippi, has introduced H. R. 3070 to aid the states in making, or having made, certain toll bridges on the system of federal-aid highways free bridges. It would provide that in cases where a state or political subdivision thereof caused a toll bridge, built or acquired prior to the date of approval of the act, to be made free prior to July 1, 1945, the Secretary of Agriculture would pay out of federal-aid funds apportioned to such state an amount not exceeding 50 per cent of the reasonable value or construction cost of the bridge. There is a proviso that any amount so paid "shall be used by the highway department of such state for matching unobligated federal-aid road funds available to the state for expenditure in the improvement of highways on the system of federal-aid highways."

I. C. C. Blocks Trucker's Attempt to By-Pass Kentucky

Declining to consider the case as a mere alternate-route application, the Interstate Commerce Commission, Division 5, has refused to grant the Dixie Ohio Express Company common-carrier trucking rights on an additional Akron, Ohio-Atlanta, Ga., route which would by-pass Kentucky and thus relieve the applicant of the "considerable difficulty" it claims to have experi-

enced in complying with the motor vehicle size and weight laws of that state. The majority opinion represented the view of Commissioners Rogers and Patterson; while Commissioner Lee dissented, citing a previous commission decision which he said had granted a request similar to Dixie's.

Among other things the majority report cited testimony of the director of the Division of Motor Transportation of Kentucky to the effect that "applicant had repeatedly violated both the terms of its state certificates and the Kentucky regulations," and that its state certificates were revoked in a decision which is now before the Kentucky courts on appeal. Granting of the application was opposed by the railroads, and a number of competing motor carriers, the latter contending that they experience the same difficulties concerning Kentucky regulations as does Dixie, but they are nevertheless compelled to comply with such regulations.

"In view of the strong opposition to the application and considering the strained relations between applicant and the Kentucky Commission," the majority report says, "we are not disposed to grant the requested authority upon any mere statement of a belief on the part of applicant that the proposed operation will effect operating economies and resulting benefits to the shipping public. In our minds, the circumstances of the case require a clear and definite showing of public convenience and necessity. We believe this reasoning is sound, for if it were otherwise, any motor carrier which did not care to comply with laws of a certain state, for reasons justifiable or not, would be before us with applications for routes leading around that state. This would certainly lead to a disordered condition in the industry contrary to the national transportation policy set forth in the act."

Reports Issued on Two Serious British Accidents

The British Ministry of Transport has recently issued reports on two serious accidents affecting passenger trains, neither of which were caused directly by war activities but which may be attributed in part to the general tension and haste common to a besieged country. One, which occurred on the London Midland & Scottish at Wembley on October 12, involved a Liverpool to London express which struck a heavily-loaded platform baggage truck. The locomotive was derailed and serious damage suffered by the first three passenger cars. The locomotive crew and nine passengers were killed and four other passengers received serious injuries.

The report states that the baggage truck, loaded with about 1,000 lb. of express matter, was being hauled across the right-of-way by three employees, "none very robust," who lost control of the vehicle at the top of a ramp so that it fouled the main running track and was struck by the locomotive, running at about 55 m. p. h.

The other accident occurred on the Great Western at Norton Fitzwarren on November 4 and caused the death of 27 persons, including two employees and 13 naval men; 56 were seriously injured. The engineman of a London to Penzance passenger train

misread signals in multiple-track territory. According to the engineman's testimony he thought he was on the main track approaching Norton Fitzwarren station and followed the signals for that track which were set clear for a fast newspaper train. Actually he had been diverted to a paralleling running (relief) track at the last junction. The towerman at the other end of the relief track had set signals and the switch against him. His locomotive was derailed at the switch and the following six cars suffered serious damage by telescoping. The report blames the accident on general strain due to blackout and war conditions. However, in addition, the report recommends that the position of signals in multiple-track sections be standardized and placed at the left of the track to which they refer. At this particular point on the G. W. R. signals are placed to the right of the line.

McAdoo, War-Time Railroad Chief, Dies at 77

William Gibbs McAdoo, who was director-general of railroads during federal war-time control, died in Washington, D. C., on February 1, at the age of 77. He had been chairman of the board of the American Presidents Steamship Line since his defeat for re-election to the Senate in 1938. Before becoming director-general of railroads in January, 1918, Mr. McAdoo had no experience in steam railroad matters, except for a short period as railroad lawyer in Tennessee.

He was born in Marietta, Ga., in 1863 and was educated at the University of Tennessee. In 1882 he became deputy clerk of the United States Circuit Court in Tennessee and in 1885 was admitted to the bar. In 1903, while practicing law in New York, he revived the Hudson River tunnel project (several unsuccessful attempts had been made to drive tunnels under the river bed in the 'Seventies and 'Eighties), and became president and director of the Hudson & Manhattan which completed, in March, 1904, its first rapid transit tunnel under the river. Following this activity Mr. McAdoo became prominent with the Democratic party and was acting chairman for the greater part of the campaign which resulted in the election of President Wilson in 1912. In March, 1913, he became Secretary of the Treasury and in 1918 became also director-general of railroads, holding this post until three days after the Armistice was signed when he was succeeded by Walker D. Hines. Mr. McAdoo remained active in politics up until 1939. He was Senator from California from 1933 to 1939.

His administration of the country's railroads during the war has been accorded varied judgments. Some critics contend that the high costs, burdensome labor agreements and failure to maintain equipment and roadway, which marked the period of federal control, were due primarily to the concentration of the country on winning the war and its consequent lack of concern for long-range industrial efficiency. Others hold that his costly administration of the railways was typical of government operation of economic machinery by a regime interested more in political than in economic achievements.

Supply Trade

The Whiting Corporation, Harvey, Ill., has opened a district sales office in the Broad Street Station building in Philadelphia, Pa. **L. D. Reed** is in charge.

The Deco Railway Devices Company, 50 Church street, New York, the **Guy H. Rumpf Machinery & Equipment Company**, 1637 Railway Exchange building, St. Louis, Mo., and **Robinson, Cary & Sands**, St. Paul, Minn., have been appointed district representatives of the **Sargent Company**, Chicago.

Charles M. Wheeler has been appointed assistant district manager of the **Union Switch & Signal Company**, with headquarters in the Empire State Building, New York. **J. K. Mickley** has been



J. K. Mickley

appointed district manager, with headquarters at Swissvale, Pa. Mr. Mickley was born in Coplay, Pa., on April 27, 1893, and graduated from Penn State College in 1914. After graduation he entered the employ of the Union Switch & Signal Company as a special engineering apprentice, serving in this capacity until 1917, when he was transferred to the commercial engineering department. Mr. Mickley remained in the commercial engineering department until 1924, when he was transferred to the Chicago office as sales engineer, in which position he remained until recently, when he was transferred to Swissvale as district manager.

Construction

GREAT NORTHERN.—This company has asked the Interstate Commerce Commission for authority to construct a new line from Galena, Wash., to Sunset Airport, eight miles. The new line will connect the company's main line with a new airport being constructed by the United States Army near Spokane, Wash.

GULF, COLORADO & SANTA FE.—A contract amounting to \$130,200 has been awarded to M. E. Worrell, Austin, Tex., for the construction of two underpasses and adjacent roadway approaches for State Highway No. 24 at Farmersville, Tex. One underpass is a highway grade separation with Main Street. The other, a grade separation with the tracks of the Gulf, Colorado & Santa Fe, will be a double track railroad bridge consisting of two 42-ft. and one 41-ft. 6 in. I-beam spans with a steel deck.

IRONTON RAILROAD.—The Pennsylvania Public Utility Commission has approved plans for the construction of a new crossing above grade at a point in Whitehall township where the reconstructed state highway route No. 555 crosses company's two tracks and right-of-way. (The Iron-ton is leased jointly by the Reading and Lehigh Valley.) Detailed plans provide for the construction of a single span reinforced concrete T-beam bridge approximately 50 ft. in length supported on reinforced concrete abutments. The new bridge will provide a reinforced vehicular roadway 26 ft. in width, a 5-ft. sidewalk and a vertical clearance of 22 ft. 8 in. above the base of rail of the railroad track. The cost of the crossing improvement is estimated at \$133,738.

MISSISSIPPI CENTRAL.—Division 4 of the Interstate Commerce Commission has extended from January 15, 1941, to March 1, 1941, the time within which this company must complete the construction of a line of railroad located in Forrest County, Miss.

UNION PACIFIC.—This company has asked the Interstate Commerce Commission for authority to construct and operate an extension of a line from Keetley, Utah, to an adjacent mine, 1.8 miles.

* * *

A Miniature Gothic Tower of Stone Covered with Ivy Forms the Crossing Gate-man's "Shanty" at the Portland Terminal Company's Passenger Station in Portland, Me.



Equipment and Supplies

Equipment Buying Pace Quickens

Jan. loco. and freight car orders exceed average for last 6 months '40

The current upturn in railway equipment buying that began in June, 1940, gained momentum during the month of January, 1941, and with the announcement of 1941 buying programs by several of the big systems, the volume of orders placed assumed boom proportions for the moment at least. Railway equipment purchases for domestic service reported in the *Railway Age* during January totaled 78 locomotives, 14,118

freight cars and 130 passenger-train cars. Of the 78 locomotives ordered 24 were steam, 49 Diesel-electric and 5 electric. Table showing comparison with the preceding month of 1940 and with the corresponding month of January last year is set forth hereunder:

	January 1941	December 1940	January 1940
Locomotives:			
Steam	24	16	23
Diesel-electric ...	49	64	27
Electric	5	..	..
Total Locos. ...	78	80	50
Freight cars	14,118	7,637	479
Passenger cars	130	..	4

Unfilled inquiries and sizeable contemplated purchases known to be pending at the year-end had clearly indicated that the usual seasonal letdown in equipment buying in evidence during the early months of recent years would not obtain in 1941. The 78 locomotives ordered during January compare favorably with the average of 73 locomotives per month purchased during the last six months of 1940. As compared with orders placed during the month of

January in preceding years, the 78 locomotives placed is exceeded in the period 1929-1941 only by the 146 locomotives ordered in January, 1930.

Of the 49 Diesel-electric locomotives ordered, 45 were for switching service and 4 for passenger service. Outstanding purchases included 30 Diesel-electric locomotives ordered by the Chicago, Burlington & Quincy, 18 Diesel-electric locomotives by the Missouri Pacific and 12 2-8-4 type locomotives by the Pere Marquette. The 5 electric locomotives ordered were placed by the Pennsylvania with company's own shops and are for passenger service. Other large purchases will be noted in the accompanying table.

The large volume of freight car purchases is perhaps the most significant as indicating railroad executive opinion of equipment requirements. Evidencing the quickening buying tempo, the total of 14,118 freight cars ordered greatly exceeds the average of 8,108 cars per month ordered during the last six months of 1940 and, as compared with orders placed during the month of January in preceding years, is exceeded in the period since 1929 only by the 16,412 cars ordered in January, 1937. Of the 14,118 freight cars purchased last month, 8,775 were ordered from the carriers' own shops, comprising 4,500 cars and 200 cabooses by the Pennsylvania, 1,000 refrigerator cars by the Pacific Fruit Express and 3,075 cars by the Chicago, Burlington & Quincy; of these latter, 1,925 are for service on Burlington's own lines, 800 for the Ft. Worth & Denver City and 350 for the Colorado & Southern. Large orders placed with builders included 1,272 cars by the Missouri Pacific, 1,050 cars by the Chesapeake & Ohio and 1,000 cars by the Chicago & North Western. The total of 14,118 freight cars purchased was divided as follows:

Domestic Equipment Orders Reported in Issues of the Railway Age in January 1941 (Including February 1)

LOCOMOTIVES				
Date	Name of Company	No.	Type	Builder
Jan. 11	Pennsylvania	5	Electric Pass.	Company Shops
Jan. 11	New York Central	1	Diesel-electric Sw.	Baldwin Locomotive Works
Jan. 25	Denver & Rio Grande Western..	5	4-6-6-4	Baldwin Locomotive Works
Jan. 25	Union Pacific	5	4-8-8-4	American Locomotive Co.
Feb. 1	Pere Marquette	12	2-8-4	Lima Locomotive Works
Feb. 1	Chesapeake & Ohio	2	4-8-4	Lima Locomotive Works
Feb. 1	Missouri Pacific	1	Diesel-electric Sw.	American Locomotive Co.
		2	Diesel-electric Sw.	Baldwin Locomotive Works
		3	Diesel-electric Sw.	Davenport-Besler Corp.
		4	Diesel-electric Sw.	Electro-Motive Corp.
		5	Diesel-electric Sw.	General Electric Co.
		3	Diesel-electric Sw.	Whitcomb Locomotive Works
Feb. 1	Chicago, Burlington & Quincy..	21	Diesel-electric Sw.	Electro-Motive Corp.
		4	Diesel-electric Pass.	Electro-Motive Corp.
		5	Diesel-electric Sw.	General Electric Co.

FREIGHT CARS				
Jan. 11	Pennsylvania	2,000	Box	Company Shops
		2,500	Gondola	Company Shops
		200	Caboose	Company Shops
Jan. 11	Illinois Central	115	H. B. Gondola	General American
Jan. 11	New York Central (P.&L.E.)..	1,000	Box	Pressed Steel Car
Jan. 11	Duluth, Missabe & Iron Range	100	Gondola	American Car & Foundry
Jan. 18	Pacific Fruit Express (U.P.&S. P.) Subsidiary	1,000	Refrigerator	Pacific Car & Foundry
Jan. 18	Chicago, Burlington & Quincy..	250	Rodger Ballast	American Car & Foundry
Jan. 25	Linde Air Products Co.....	20	Box	Pressed Steel Car
Jan. 25	Virginian	100	Box	Pressed Steel Car
Jan. 25	Union Pacific	300	Flat	Pullman-Standard
		50	M. T. Gondola	Pullman-Standard
Jan. 25	Tennessee Coal, Iron & R. R...	20	Gondola	Pullman-Standard
		6	Hot-hole	Pullman-Standard
Jan. 25	Chicago & North Western.....	750	Gondola	General American
		250	Gondola	Bethlehem Steel Co.
Feb. 1	Chicago, Burlington & Quincy..	200	Hopper	Company Shops
		1,500	Box	Company Shops
	(Colorado & Southern)	225	Auto Parts	Company Shops
		100	Flat	Company Shops
	(Ft. Worth & Denver City)....	250	Box	Company Shops
		300	Stock	Company Shops
Feb. 1	Missouri Pacific	500	Box	Company Shops
		400	Hopper	American Car & Foundry
		2	Well	American Car & Foundry
		400	Hopper	Bethlehem Steel Co.
		400	Hopper	Mt. Vernon Car
Feb. 1	Chesapeake & Ohio	70	Cov. Hopper	Mt. Vernon Car
		250	Box	American Car & Foundry
		50	Flat	Bethlehem Steel Co.
		250	Box	General American
		250	Box	Mt. Vernon Car
Feb. 1	Pere Marquette	250	Box	Pullman-Standard
		40	Caboose	St. Louis Car

PASSENGER-TRAIN CARS				
Jan. 11	New York Central	25	Coach	American Car & Foundry
		25	Coach	Pressed Steel Car
		45	Coach	Pullman-Standard
Jan. 25	Chicago, Rock Island & Pacific	3		Edward G. Budd Mfg. Co.
Feb. 1	New York Central	2	Mail-Mail Storage	Edward G. Budd Mfg. Co.
		2	Tav.-Lounge-Baggage	Edward G. Budd Mfg. Co.
		6	Parlor	Edward G. Budd Mfg. Co.
		4	Diner	Edward G. Budd Mfg. Co.
		16	Coach	Edward G. Budd Mfg. Co.
		2	Observation-Buffer	Edward G. Budd Mfg. Co.

6,595 box
3,785 gondola
1,720 hopper
1,000 refrigerator
472 flat
300 stock
240 caboose
6 hot hole

The size of the program of reconstruction engaged in by the railroads is indicated by the fact that in the eight months ended January 31, during which period the current uptrend in freight car buying has been in effect, approximately 70,000 cars have been ordered by the carriers for domestic service. These purchases have been carefully spaced out over the period.

As is to be noted, the heavy increase in the number of passenger-train cars ordered is due to large scale purchases by the New York Central. Of the total of 130 cars ordered, 127 were placed by this company, comprising 95 coaches and two new complete streamlined trains for company's Empire State Express. Total cost of these purchases has been estimated at \$7,500,000.

Rail purchases reported by the carriers during January totaled 76,688 tons.

The conditions that have brought about the current uptrend in equipment buying remain in effect. Ordinarily, railway purchases of equipment are closely related to the trend of net railway operating income. Results for the year 1940 were in many instances better than anticipated. The possibilities for 1941 indicate that the best

earnings in a long span of years are likely. Increased traffic and increased gross revenues are being successfully converted into substantially higher net income and rising industrial activity indicates continued improvement.

Chicago & North Western Orders 1,700 Freight Cars

The Chicago & North Western has placed orders for a total of 1,700 freight cars as follows:

- 750—50 ton gondola cars, General American Transportation Corp.
- 250—50 ton gondola cars, Bethlehem Steel Company
- 500—50 ton box cars, Pullman-Standard Car Manufacturing Co.
- 200—70 ton ore cars, Bethlehem Steel Company

Inquiry for this equipment was reported in the *Railway Age* of December 21 and the reported placing of 1,000 gondola cars in the *Railway Age* of January 25. The 1,000 gondola cars are included in the table summarizing orders reported in the month of January presented elsewhere in this issue.

LOCOMOTIVES

Southern Pacific Orders 15 Diesel Locomotives

The Southern Pacific has placed orders for a total of 15 Diesel-electric switching locomotives as follows: 8 of 600-hp. to the Electro-Motive Corp.; 5 of 660-hp. to the American Locomotive Co., and 2 of 600-hp. to the Baldwin Locomotive Works. Total cost of the order is estimated at \$900,000. Deliveries are expected in March and April.

THE DETROIT, TOLEDO & Ironton has ordered four 2-8-2 type locomotives from the Lima Locomotive Works.

THE NEW YORK, NEW HAVEN & HARTFORD will purchase five electric locomotives. This is in addition to ten Diesel-electric switching locomotives, inquiry for which was reported in the *Railway Age* of January 18.

THE UNITED STATES NAVY DEPARTMENT, Bureau of Supplies and Accounts, Washington, D. C. will receive bids on February 18 for one 50-ton Diesel-electric locomotive for service at White Plains, Md.

THE NORTHERN PACIFIC has ordered seven 1,000-hp. Diesel-electric locomotives, placing three with the Electro-Motive Corporation, two with the American Locomotive Company and two with the Baldwin Locomotive Works.

FREIGHT CARS

THE NEW, YORK, NEW HAVEN & HARTFORD is contemplating the purchase of 1,000 box cars and 25 cabooses.

THE BETHLEHEM STEEL COMPANY will construct 100 gondola cars for its Sparrows Point, Md., plant.

THE MINNEAPOLIS, ST. PAUL & SAULT STE. MARIE has asked the District court

for permission to order 50 ballast cars from the American Car & Foundry Co., and 100 flat cars from the Pullman-Standard Car & Manufacturing Co.

THE MINNEAPOLIS & ST. LOUIS is inquiring for 75 double-sheathed auto-box cars, fifty of 50 tons' and twenty-five of 40 tons' capacity.

PASSENGER CARS

THE NORFOLK & WESTERN is inquiring for 15 coaches.

THE NEW YORK, NEW HAVEN & HARTFORD is contemplating the purchase of five grill cars.

THE CHICAGO & NORTH WESTERN has received permission from the district court to purchase streamlined passenger equipment consisting of five 2,000 hp. Diesel-electric locomotives and 25 passenger cars for use between Chicago and Wisconsin and southern Minnesota points. Application for authority to purchase this equipment was reported in the *Railway Age* of January 25.

IRON AND STEEL

THE ERIE has ordered 4,466 tons of rail, allocating 4,156 tons to the Carnegie-Illinois Steel Corporation and 310 tons to the Bethlehem Steel Company.

SIGNALING

THE UNION RAILROAD has contracted with the Union Switch & Signal Co. for the complete installation of new automatic block signaling and the modernization of two electro-pneumatic interlockings on its lines in the vicinity of Pittsburgh. The new work will be carried out on three sections of the road, including the North Bessemer, Mifflin, and Clairton Lines, totaling 16 miles of double track and involving 50 position-light signals. The blocking will be arranged so that ascending grade tracks will be signaled under a two-block system, while the descending grade tracks will employ three-block signaling. Coded track circuits will be used throughout the automatic block territory, thus eliminating the use of line wires.

MOTOR VEHICLES

THE A.C.F. MOTORS COMPANY has received an order from the Southeastern Greyhound Lines for four air-conditioned deluxe motor coaches.

THE BOSTON & MAINE has established a special week-end train service for army men between Camp Devens, near Ayer, Mass., and Boston, with a special round-trip rate of \$1 for the round-trip of 72 mi. This "furlough-special," to be a regular week-end run, will leave from a special spur track inside the Army encampment every Saturday at 12:30 p. m. and arrive in Boston at 1:30 p. m. The return trip will leave Boston Sundays at 9:30 p. m. and arrive at the cantonment siding at 10:30 p. m.

Financial

ATCHISON, TOPEKA & SANTA FE-CHICAGO, BURLINGTON & QUINCY-COLORADO & SOUTHERN-DENVER & RIO GRANDE WESTERN-CHICAGO, ROCK ISLAND & PACIFIC.—*Operation.*—These companies have been authorized by Division 4 of the Interstate Commerce Commission to operate, under trackage rights, over a part of the Denver & Intermountain between Denver, Colo., and Remaco, seven miles.

CHESAPEAKE & OHIO.—*Bond Issue.*—After considerable doubt in financial circles whether it would float the issue through traditional negotiation or by competitive bidding, this road has followed the former procedure in part and in part resorted to private placement in issuing its new serial refunding bonds on February 5. The new issue of refunding and mortgage bonds (series G-1 to G-25) aggregates \$24,800,000 in principal amount, and matures in varying amounts from February 1, 1942 to 1966, with coupons running from 0.35 per cent for earliest maturity to 2.90 per cent for the latest. Together with cash to be provided by the road, proceeds from the serial issue will be used to redeem \$29,100,000 of 3½s, due 1963.

The C. & O. sold \$18,310,000 of the issue to Morgan Stanley & Co. at 99½ for maturities due in one to ten years and at 98½ for maturities from 11 to 25 years. These were re-offered publicly on February 6 by a sub-underwriting group at par. The remaining bonds of the issue—\$6,490,000, all in the one- to ten-year maturity range, were sold privately to a group of banks at par.

ILLINOIS CENTRAL.—*Equipment Trust Certificates.*—Division 4 of the Interstate Commerce Commission has amended its order in Finance Docket No. 13045 so as to permit this company to (1) substitute one 1,000 h.p. and two 2,700 h.p. Diesel-electric locomotives for three 2,000 h.p. Diesel transfer locomotives contemplated in the original order, and (2) purchase an additional 115 70-ton all-steel covered hopper cars at a cost of \$447,750. The purchase of the additional cars was made possible because of price concessions given by the manufacturers on the other equipment authorized to be purchased.

ILLINOIS TERMINAL.—*Equipment Trust Certificates.*—This company has asked the Interstate Commerce Commission for authority to assume liability for \$560,000 of equipment trust certificates, maturing in 10 equal annual installments of \$56,000 on February 15 in each of the years from 1942 to 1951, inclusive. The proceeds will be used as part payment for new equipment costing a total of \$706,000 and consisting of 250 50-ton all-steel box cars.

KANSAS CITY, KAW VALLEY & WESTERN.—*Reorganization.*—Division 4 of the Interstate Commerce Commission has sent ballots to all owners of claims and securities of this company as of February 5, 1941, asking them to either approve or disapprove of the final plan of reorganization under section 77 of the Bankruptcy Act.

Ballots must be returned to the commission on or before March 25, 1941.

MONONGAHELA.—Bond Issue.—Morgan Stanley & Co. and Kuhn, Loeb & Co. and a group of 36 additional underwriters offered on February 5 a new issue of \$11,418,000 first mortgage, 3¼ per cent Series B, bonds of this road. Priced at 102½ per cent, to yield 3.10 per cent, the bonds are dated February 1 and are due 1966. Proceeds from the issue, together with funds provided by the railroad, will be used to retire on May 1 outstanding \$11,418,000 of first mortgage 4's due May 1, 1960, at the call price of 105. The bonds are unconditionally guaranteed as to principal and interest jointly and severally by the Pittsburgh & Lake Erie, the Baltimore & Ohio and the Pennsylvania, which together own all the capital stock of the Monongahela.

NEW YORK CENTRAL.—Equipment Trust Certificates.—This company has asked the Interstate Commerce Commission for authority to assume liability for \$10,900,000 of equipment trust certificates, maturing in 10 equal annual installments of \$1,090,000 on February 15 in each of the years from 1942 to 1951, inclusive. The proceeds will be used as part of the purchase price of new equipment costing a total of \$12,173,885 and consisting of 200 70-ton steel flat cars, 600 55-ton steel box cars, 145 55-ton steel auto box cars, 100 55-ton end door box cars, 36 oil-electric switching locomotives, 95 all-steel passenger coaches, 16 all-steel passenger coaches, six all-steel parlor cars, four all-steel dining cars, two all-steel observation-buffet cars, two all-steel tavern-lounge-baggage cars, and two all-steel Railway Post Office mail and storage cars.

The application points out that all the equipment enumerated above following the 95 all-steel passenger coaches will be of stainless steel and will constitute equipment for two complete passenger trains.

The railroad has awarded the issue after competitive bidding to Solomon Brothers & Hutzler, Dick & Merle-Smith and Stroud & Co., New York, on a bid of 100.054 for obligations bearing interest at the rate of 1½ per cent, representing an interest cost to the railroad of 1.87 per cent. The first four maturities of the issue, amounting to \$4,360,000 were re-offered publicly at prices to yield 0.40 to 1.20. The final six maturities were privately placed with institutional investors.

PENNSYLVANIA.—Equipment Trust Certificates.—This company has been authorized by Division 4 of the Interstate Commerce Commission to assume liability for \$11,925,000 of 1¾ per cent equipment trust certificates, maturing in 15 equal annual installments of \$795,000 on February 1 in each of the years from 1942 to 1956, inclusive. The issue has been sold at 100.043 to a group headed by the First Boston Corporation, making the average annual cost to the company approximately 1.74 per cent.

ST. LOUIS-SAN FRANCISCO.—Salary of General Counsel.—M. G. Roberts, who has recently been appointed general counsel for this company in place of Joseph W. Jamison, deceased, has asked the Interstate

Commerce Commission to fix his annual salary at \$18,000 a year. The company is in reorganization under section 77 of the Bankruptcy Act, and the law provides that although the District Court may appoint the trustees and general counsel, the commission must fix the maximum limits of their salaries.

SEABOARD AIR LINE.—Equipment Trust Certificates and R. F. C. Financing.—Division 4 of the Interstate Commerce Commission has approved a plan whereby this company would issue and sell to the Reconstruction Finance Corporation \$1,905,000 of three per cent equipment trust certificates, maturing in 15 equal annual installments of \$127,000 on January 1 in each of the years from 1942 to 1956, inclusive.

SOUTHERN NEW YORK.—Abandonment.—This company would be authorized to abandon operation of the part of its line of railroad extending from West Oneonta, N. Y., to Jordanville, 41.2 miles, together with a branch from Index, N. Y., to Cooperstown, 2.1 miles, if Division 4 of the Interstate Commerce Commission adopts a proposed report of its Examiner R. R. Molster.

WICHITA FALLS & SOUTHERN.—Operation.—This company has been authorized by Division 4 of the Interstate Commerce Commission to extend the agreement under which it operates, under trackage rights, over a portion of the line of the Wichita Valley between Maple Switch, Tex., and the Wichita Falls Union Station, 3.2 miles, to and including December 31, 1950, and thereafter until terminated upon one year's written notice by either party.

WINCHESTER & WESTERN.—Purchase and Securities.—This company, recently formed, has been authorized by Division 4 of the Interstate Commerce Commission to purchase and operate the properties of the Winchester & Wardensville. At the same time the new company was authorized to issue \$25,000 of capital stock, consisting of 250 shares of a par value of \$100 a share, and \$25,000 of income-mortgage bonds, the bonds and \$23,000 of the stock to be delivered in payment for property formerly owned by the Winchester & Wardensville, and \$1,700 of the stock to be sold for cash at par and the proceeds used for reorganization expenses.

Dividends Declared

Cleveland & Pittsburgh.—Guaranteed, 87½¢, quarterly; Special Guaranteed, 50¢, quarterly, both payable March 1 to holders of record February 10.

Erie & Kalamazoo.—\$1.25, payable February 1 to holders of record January 27.

Norfolk & Western.—\$2.50, quarterly, payable March 19 to holders of record February 28.

North Carolina.—7 Per Cent Guaranteed, \$3.50, semi-annually, payable February 1 to holders of record January 21.

Passaic & Delaware.—\$1.25, semi-annually, payable February 1 to holders of record January 24.

Syracuse & Binghamton.—\$3.00, quarterly, payable February 1 to holders of record January 24.

Average Prices of Stocks and Bonds

	Feb. 4	Last week	Last year
Average price of 20 representative railway stocks..	29.60	31.49	31.72
Average price of 20 representative railway bonds..	62.89	64.39	59.14

Railway Officers

EXECUTIVE

Sydney F. Small, vice-president in charge of taxation and public relations of the Norfolk & Western, has been appointed vice-president—assistant to president, with headquarters as before at Roanoke, Va. The position of vice-president in charge of taxation and public relations has been abolished, effective February 1.

Charles W. Schwartz, assistant general superintendent of the Conemaugh & Black Lick, was elected vice-president and general superintendent, with headquarters at Johnstown, Pa., on January 28, succeeding the late **H. E. Trout**. **Robert F. Campbell**, superintendent of car service, has been promoted to assistant general superintendent, to succeed Mr. Schwartz.

J. W. St. Clair, assistant general superintendent of the South Buffalo railway, has been promoted to vice-president and general superintendent, with headquarters at Lackawanna, N. Y., succeeding **Frank M. Benning**, who has retired because of ill health. **Charles G. Brown**, office assistant to Mr. St. Clair, has been promoted to assistant superintendent.

FINANCIAL, LEGAL AND ACCOUNTING

Sigurd Ueland has been appointed co-trustee and counsel of the Duluth, South Shore & Atlantic and of the Mineral Range Railroad, with headquarters at Minneapolis, Minn., succeeding **James L. Homire**, who has resigned.

Theodore P. Scott, assistant secretary and assistant treasurer of the Lehigh & New England, with headquarters at Philadelphia, Pa., has been elected treasurer, effective January 1, succeeding **Henry H. Pease**, who will continue as secretary of the company.

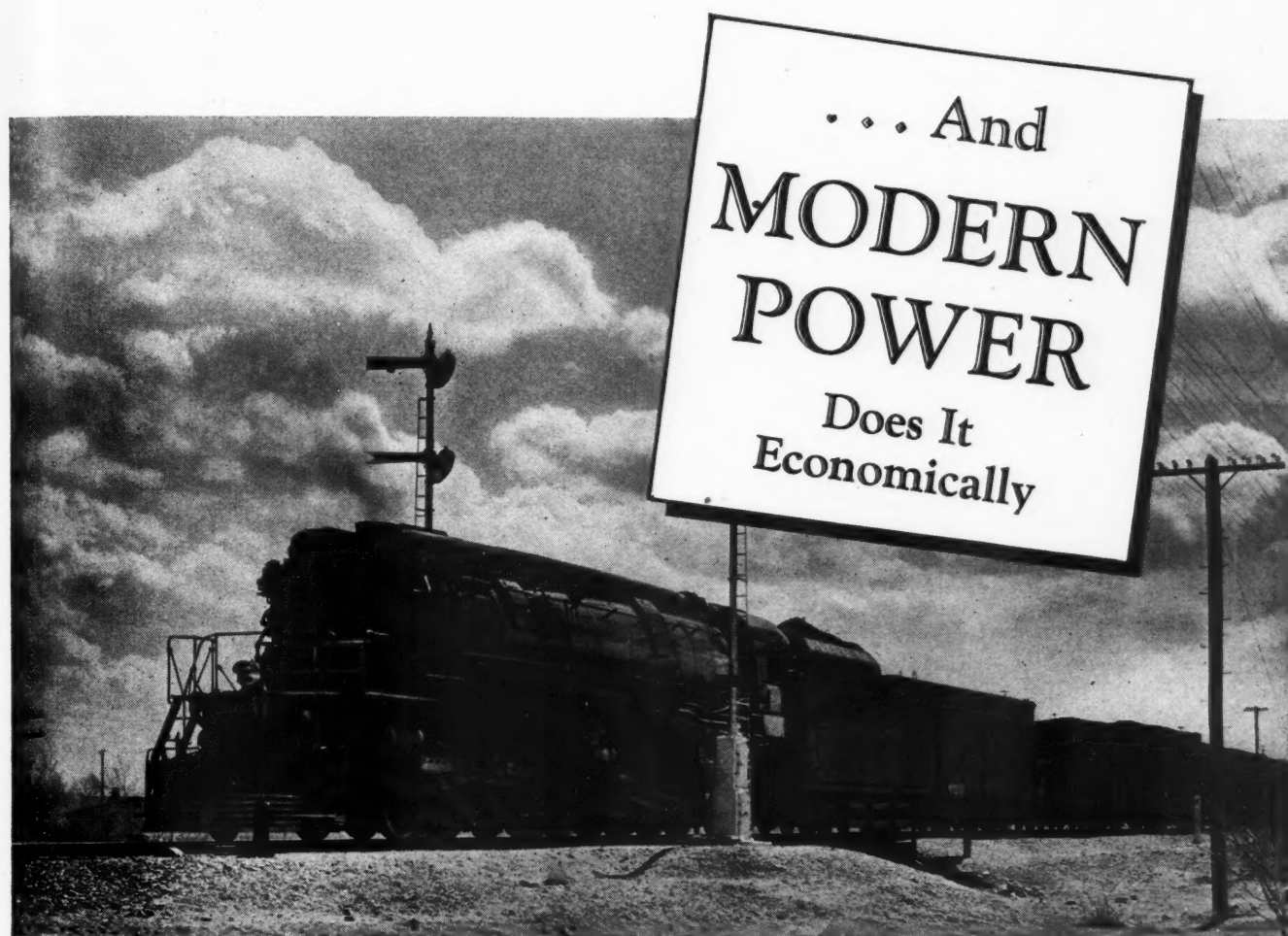
M. L. Countryman, Jr., assistant general counsel of the Northern Pacific, has been promoted to general solicitor, a newly created position, with headquarters as before at St. Paul, Minn. Mr. Countryman was born in St. Paul, Minn., and graduated from the University of Minnesota in 1916, and from the University College of Law in 1920. During the first World War he served in 1917 and 1918 as a captain in the 78th Infantry. After practicing law in Sioux Falls, S. D., and Duluth, Minn., in 1921 and 1922, he joined the legal department of the Great Northern and in 1924 he went with the Northern Pacific as general attorney. Mr. Countryman was advanced to assistant general counsel in 1928.

OPERATING

W. A. Swindell, assistant superintendent of the Atlanta division of the Nashville, Chattanooga & St. Louis, has been promoted to superintendent of that division,

Continued on next left-hand page

The Railroads Have a Job to do . . .



Today the railroads are faced with the problem of moving more freight . . . faster. Some railroads have found that the truly economical way to meet these demands is with MODERN POWER.

Modern locomotives are capable of handling the increased loads and maintain the rigid time schedules demanded by shippers.

Order your new locomotives from Lima now. Be ready for the traffic demands that the next few months will impose.

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with headquarters as before at Atlanta, Ga., succeeding **E. A. Hibbett**, who retired on February 1.

J. H. Rigby, superintendent of the Columbus & Greenville, has been appointed general manager, with headquarters as before at Columbus, Miss.

Fred C. Paulsen, general superintendent of the South-Central district of the Union Pacific, has been promoted to assistant general manager of that district, with headquarters as before at Salt Lake City, Utah.

R. G. Webb, trainmaster on the Chicago, Milwaukee, St. Paul & Pacific at Tacoma, Wash., has been promoted to assistant superintendent of the Rocky Mountain division, a newly created position, with headquarters at Lewistown, Mont. **R. A. Middleton**, trainmaster at Lewistown, has been transferred to Butte, Mont., succeeding **J. O'Dore**, who has been transferred to Miles City, Mont. Mr. O'Dore relieves **C. A. Nummerdor**, who has been transferred to Tacoma, replacing Mr. Webb. The position of trainmaster at Lewistown has been abolished.

Harry L. Nancarrow, whose promotion to general superintendent of the Lake division of the Pennsylvania at Cleveland, Ohio, was reported in the *Railway Age* of February 1, was born on January 13, 1897,



Harry L. Nancarrow

at Jersey Shore, Pa. Mr. Nancarrow received his mechanical engineering degree from Bucknell University in 1920, and entered railroad service on October 7, 1920, as draftsman in the office of the superintendent of motive power of the Pennsylvania at Philadelphia, Pa. On March 14, 1921, Mr. Nancarrow was appointed special apprentice at the Altoona machine shops, becoming inspector of motive power there on April 17, 1924. He was appointed gang foreman on the Cleveland division on September 1, 1924, and became assistant enginehouse foreman on February 10, 1926. On March 1, 1927, he became assistant master mechanic on the Akron division, being promoted to master mechanic of the Erie & Ashtabula division on May 16, 1928. On January 1, 1929, he was transferred to the Baltimore division and then to the Philadelphia Terminal division. On September 16, 1936, he became superintendent of the Logansport division,

being transferred to the Buffalo division on January 16, 1938. He became superintendent passenger transportation of the Eastern Region at Philadelphia, on May 1, 1939, and was appointed superintendent of the Pittsburgh division at Pittsburgh, Pa., on January 16, 1940, the position he held until his recent promotion.

TRAFFIC

H. F. Burnaugh, assistant general freight agent on the Denver & Rio Grande Western at Denver, Colo., has been promoted to assistant freight traffic manager, a newly created position, with the same headquarters. The position of assistant general freight agent, formerly held by Mr. Burnaugh, has been abolished.

Joe L. Erwin, traveling freight and passenger agent on the Missouri-Kansas-Texas at Dallas, Tex., has been promoted to division freight and passenger agent at Austin, Tex., succeeding **W. P. Lacy**, who has been appointed division freight agent at Kansas City, Mo., replacing **H. K. Spellman**, deceased.

William G. Hunton, agricultural and industrial agent of the Maine Central, with headquarters at Portland, Me., has retired, effective February 1, after 29 years of railroad service. **Harold R. Cummings**, real estate and tax agent, has been promoted to industrial, real estate and tax agent.

A. J. Parr, general freight and passenger agent of the Temiskaming & Northern Ontario, has been appointed traffic manager, with headquarters as before at North Bay, Ont. **C. O. Baker** has been appointed assistant traffic manager and **R. P. C. McLeod** has been appointed general freight and passenger agent, both at North Bay.

J. C. Moore, general agent, freight department on the Spokane, Portland & Seattle, at Portland, Ore., has been promoted to assistant to the general freight agent, with the same headquarters, succeeding **J. M. Ballingall**, whose death on December 27 was announced in the *Railway Age* of January 18. **George F. Ehlen**, traveling freight agent in the Willamette valley, has been advanced to general agent, freight department, at Portland, replacing Mr. Moore.

H. D. Stange, chief clerk in the general freight office of the Baltimore & Ohio at Baltimore, Md., has been appointed division freight agent at Vincennes, Ind., succeeding **L. E. Clifton Roehrig**, who has been transferred to Chillicothe, Ohio, replacing **C. P. Bauchens**, who has been appointed special representative. **W. M. Smothers**, industrial agent at Pittsburgh, Pa., has been transferred to Chicago, succeeding **C. M. McKeen**, who has been promoted to acting freight agent for the Alton at Chicago. **Fielding H. Lewis** has been appointed industrial agent at Pittsburgh, relieving Mr. Smothers.

James Peter Dervin, whose appointment as freight traffic manager of the New York Central at New York was reported in the *Railway Age* of January 25, was born at Center Rutland, Vt., on February

22, 1883. He entered railroad service in 1900 as stenographer and clerk in the office of the auditor of the Rutland at Rutland, Vt., in which capacity he served until 1903, when he went with the New York Central (Lines East) at New York, serving until 1916 as stenographer, rate clerk and chief clerk to assistant general freight agent. From 1916 to 1923, Mr. Dervin was chief of tariff bureau, becoming general freight agent on the latter date. Mr. Dervin was appointed assistant freight traffic manager at New York in 1929, the position he held until his recent appointment.

Allen R. Gould, traffic manager of the Chicago & North Western, has been appointed traffic manager in charge of the sale of freight and passenger transportation, with headquarters as before at Chicago, and **R. O. Small**, freight traffic manager, has been appointed traffic manager in charge of rates and divisions. **R. C. Stubbs**, assistant general freight agent, has been promoted to assistant traffic manager, with headquarters as before at Chicago. **A. O. Olson**, general agent at Pittsburgh, Pa., has been advanced to general freight agent at Chicago, and **F. T. Lewis**, general agent at Salt Lake City, Utah, has been transferred to Pittsburgh, succeeding Mr. Olson. **G. A. Remington**, assistant general freight and passenger agent at Omaha, Neb., has been promoted to general freight and passenger agent at that point, a change of title. **H. L. Davis**, traveling agent at Toronto, Ont., has been appointed Canadian traffic representative, with the same headquarters.

George Henry Clark, whose appointment as assistant freight traffic manager of the New York Central at New York was reported in the *Railway Age* of January 25, was born at Brooklyn, N. Y., on February 7, 1878, and went with the American Express Company in 1892. Mr. Clark entered railroad service in 1900 with the Merchants Despatch Transportation Co. (New York Central) and in 1904 became contracting freight agent. From 1905 to 1911 he was chief clerk, becoming division freight agent at Utica, N. Y., on the latter date. Mr. Clark was general freight and passenger agent of the Ottawa & New York railway (now New York Central) from 1912 to 1916, when he became division freight and passenger agent for the New York Central at Ottawa, Ont. He was appointed division freight agent at New York in 1922 and became assistant general freight agent at New York in 1923. From 1927 to 1929 Mr. Clark was assistant to traffic manager and from January to December, 1929, he served as general freight agent at New York. He was assistant freight traffic manager from 1929 to 1932, becoming general freight agent at New York in July, 1932, the position he held until his recent appointment.

J. M. Breen, whose appointment as general freight agent of the New York Central at New York was reported in the *Railway Age* of January 25, was born at Ada, Ohio, on June 6, 1884. He entered railroad service in 1900 with the Cleveland, Cincinnati, Chicago & St. Louis at Chicago and served until 1909 as mes-

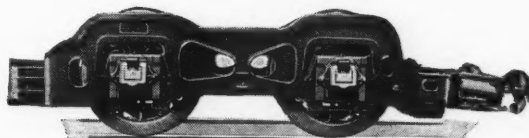
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DOWN grade on which to start

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BOOSTER***

You would move heavier loads if all starts were on down-grades. This, unfortunately, doesn't happen; BUT, you can install The Locomotive Booster and achieve the same effect. The Locomotive Booster, by capitalizing idle weight and spare steam, gives

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Give your trains a "Down-hill Start" . . . install Locomotive Boosters and increase the number of cars per train.



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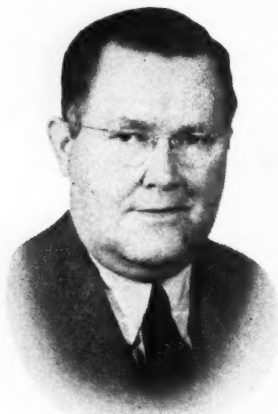
NEW YORK

CHICAGO

MONTREAL

senger, bill of lading clerk, assistant rate clerk and traveling freight agent, successively. In 1909 he became traveling freight agent at Pittsburgh for the same road, being transferred to New York in 1911. Mr. Breen was appointed industrial agent for the New York Central at New York in 1912, becoming chief clerk to vice-president at New York the same year. From 1914 to 1917, he was general agent and division freight agent for the Big Four at Pittsburgh and Cleveland, Ohio. On February 15, 1917, he went with the Standard Chemical Co., Pittsburgh, as eastern sales manager and on August 1, 1931, re-entered the service of the New York Central in the office of the vice-president at New York. On October 10, 1932, Mr. Breen became assistant to freight traffic manager at New York and on June 1, 1935, was appointed assistant general freight agent, the position he held until his recent appointment.

Bernard W. Hanson, whose promotion to traffic manager on the Union Pacific, with headquarters at Salt Lake City, Utah, was announced in the *Railway Age* of January 18, was born in Flanagan, Ill., on July 1, 1891, and entered railway service in 1915 as a traveling agent for the Chicago & North Western at Salt Lake City. Dur-



Bernard W. Hanson

ing the first World War he served in the Division of Purchases, Storage and Traffic of the War Department at Washington, D. C., and in 1923 he returned to railroad service as a statistician in the freight department of the Union Pacific at Salt Lake City, later being promoted successively to chief clerk to the assistant traffic manager and general agent, freight department, at that point.

ENGINEERING AND SIGNALING

E. W. Robinson, division engineer on the Canadian National at Port Arthur, Ont., has been appointed assistant engineer on the Western region, with headquarters at Winnipeg, Man.

F. D. Kinnie, district engineer of the Coast lines of the Atchison, Topeka & Santa Fe, with headquarters at Los Angeles, Cal., has been appointed regional engineer, with the same headquarters, a newly created position, assigned to special duties in connection with national defense and industrial projects. **M. B. Clark**, division engineer at San Bernardino, Cal.,

has been promoted to acting district engineer at Los Angeles, succeeding Mr. Kinnie, and **R. D. Pierson**, division engineer at Winslow, Ariz., has been transferred to San Bernardino. **E. L. McDonald**, assistant division engineer at Needles, Cal., has been advanced to acting division engineer at Winslow, relieving Mr. Pierson.

PURCHASES AND STORES

Francisco Perez has been appointed general purchasing agent of the National Railways of Mexico, with headquarters at Mexico City, succeeding **Juan M. Velasco**, who has been appointed purchasing agent.

MECHANICAL

W. J. Creighton has been appointed traveling engineer of the eastern lines of the Canadian Pacific, with headquarters at Toronto, Ont.

W. F. Kascal, general foreman on the Chicago, Burlington & Quincy at Lincoln, Neb., has been appointed acting master mechanic of the Lincoln and Wymore divisions, with the same headquarters, succeeding **T. E. Paradise**, who has been ill for some time.

Frank Kenneth Mitchell, assistant to general superintendent motive power of the New York Central, has been promoted to assistant general superintendent motive power and rolling stock, with headquarters as before at New York, effective February 1.

A. L. Wright, superintendent of shops of the Boston & Albany at West Springfield, Mass., has been appointed assistant to general superintendent of motive power of the New York Central system, with headquarters at New York. **G. W. Birk** has been appointed assistant to general superintendent of motive power at New York. **T. J. Lyon** has been appointed superintendent of shop at West Springfield.

Horace B. Stetson, whose appointment as superintendent of the Williamsport division of the Pennsylvania at Williams-



Horace B. Stetson

port, Pa., was reported in the *Railway Age* of February 1, was born on March 9, 1895, at Bristol, Pa. He entered railroad serv-

ice as a clerk on the New York division on October 12, 1915, and was furloughed for military duty from June 1, 1917, to July 21, 1919, when he returned to the Pennsylvania as assistant yardmaster on the New York division. Mr. Stetson was promoted to passenger yardmaster on April 1, 1925, and advanced to assistant passenger trainmaster on that division on February 1, 1928. He became passenger trainmaster on September 1, 1936, and assigned to the Middle division, which position he occupied until his recent appointment, with the exception of eight and one-half months, from November 1, 1937, to July 16, 1938, when he had charge of passenger train service on the Baltimore division.

Carleton K. Steins, whose appointment as mechanical engineer of the Pennsylvania at Philadelphia, Pa., was reported



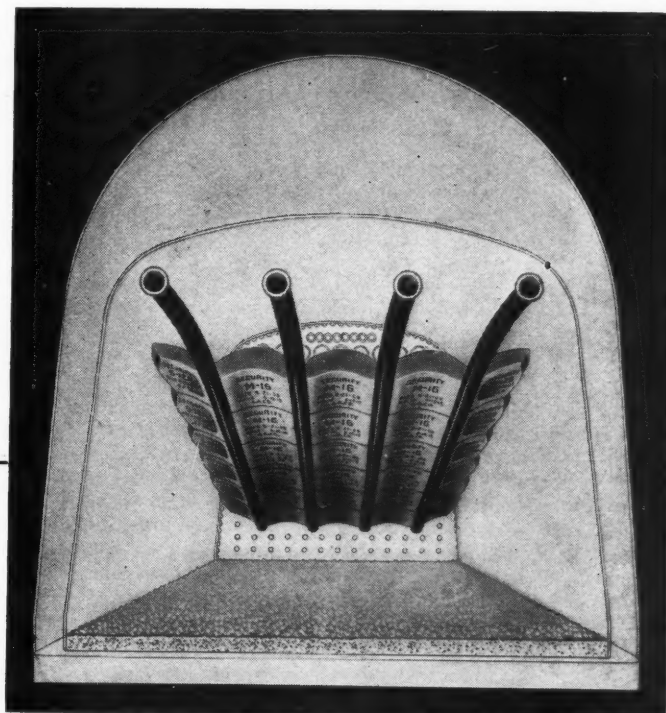
Carleton K. Steins

in the *Railway Age* of February 1, was born at East Orange, N. J., on February 21, 1891, and was graduated from the Stevens Institute of Technology in 1913 with a degree in mechanical engineering. Mr. Steins entered railroad service in July, 1913, as special apprentice in the motive power department of the Pennsylvania and was furloughed for military service in 1917, serving overseas with the 19th Engineers as first lieutenant. In May, 1919, he returned to the Pennsylvania as assistant master mechanic, New York division, and subsequently became assistant engineer of motive power at New York, Harrisburg, Pa., and Philadelphia. In 1928 Mr. Steins was appointed master mechanic at Indianapolis, Ind., and in 1929 was transferred to Wilmington, Del. In April, 1937, he became assistant chief of motive power—locomotive, in which capacity he served until his recent appointment.

Warren Robert Elsey, whose appointment as general superintendent of motive power of the Pennsylvania at Philadelphia, Pa., was reported in the *Railway Age* of February 1, was born on April 1, 1892, at Pittsburgh, Pa., and was graduated from the Carnegie Institute of Technology in 1910. He entered railroad service on September 26, 1911, as draftsman on the Pennsylvania at Pittsburgh and served in this capacity until March 16, 1916, when he became piece work inspector at Shire Oaks, Pa. On July 16, 1917, he was appointed shop inspector, with headquarters at South Pittsburgh, Pa., becoming assistant master

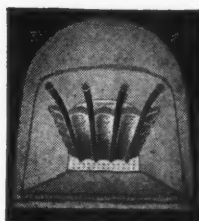
A CORRECT BRICK ARCH GUARANTEES FULL FUEL ECONOMY

There is a carefully worked out design of the Security Brick Arch for every class of locomotive . . . This design guarantees maximum efficiency both as to fuel economy and hauling capacity . . . In modernizing existing power and in maintaining locomotives in active service, be sure the correct brick arch design is installed and be sure it is completely maintained.



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Refractory Specialists



**AMERICAN ARCH CO.
INCORPORATED**
60 EAST 42nd STREET, NEW YORK, N. Y.
*Locomotive Combustion
Specialists*

mechanic at Canton, Ohio, on April 1, 1920, and motive power inspector of the Western Pennsylvania division on March 1, 1921. Mr. Elsey was appointed assistant master mechanic at Conemaugh, Pa., on



Warren Robert Elsey

February 1, 1923, which position he held until February 1, 1928, when he was promoted to master mechanic at Baltimore, Md. From January to December, 1929, he was acting superintendent of floating equipment at Jersey City, N. J., and on December 1, 1929, he became superintendent of floating equipment there. Mr. Elsey was appointed mechanical engineer at Philadelphia, Pa., on October 1, 1936, which position he held until his recent appointment.

Harry W. Jones, whose appointment as chief of motive power of the Pennsylvania at Philadelphia, Pa., was reported in the *Railway Age* of February 1, was born on December 30, 1884, and entered railway service with the Pennsylvania as machinist apprentice in the Sunbury, Pa., shops in 1903. In 1908 he was appointed assistant enginehouse foreman at Sunbury, becoming enginehouse foreman at Renovo, Pa., in 1911 and shop inspector in the office of the superintendent



Harry W. Jones

of motive power at Williamsport, Pa., in 1912. In 1913 he was appointed general foreman of the Olean (Pa.) shops, which

position he held until 1915 when he was appointed shop inspector in the office of the general superintendent of motive power at Altoona, Pa. Mr. Jones was appointed assistant master mechanic, Wilmington, Del., in 1917 and served as master mechanic at Sunbury and Renovo from 1918 until 1921, when he was transferred to the Juniata shops at Altoona. In 1929 he went to Pittsburgh, Pa., as superintendent motive power, Western Pennsylvania division, and in 1930 became general superintendent motive power of the Central region at Pittsburgh, going to Indianapolis, Ind., in 1933 as general superintendent of the Southwestern division. In 1937 he was transferred to the Eastern Pennsylvania division at Harrisburg, Pa., in which position he served until his recent appointment.

Robert George Bennett, whose appointment as assistant chief of motive power of the Pennsylvania at Philadelphia, Pa., was reported in the *Railway Age* of February 1, was born on March 31, 1882, at Brighton, England, and was graduated from Purdue University in 1908 with the degree of bachelor of science in mechanical engineering, receiving his mechanical engineering degree in 1915. He entered railway service in January, 1900, as a mat-



Robert George Bennett

chinist's apprentice on the Pennsylvania at Erie, Pa., and completed his apprenticeship in 1904 at the Renovo (Pa.) shops. While attending college, Mr. Bennett was employed during summer months as a machinist, draftsman and inspector on the Pennsylvania. In November, 1908, he was appointed motive power inspector of the Monongahela division, holding that position until March, 1912, when he became rodman in the maintenance of way department, Pittsburgh division. He was appointed inspector in the test department in March, 1913, in charge of the locomotive test plant at Altoona, Pa. In May, 1916, Mr. Bennett became assistant master mechanic on the Cumberland Valley (part of the Pennsylvania) at Chambersburg, Pa., and in February, 1917, was appointed assistant engineer of motive power of the Central division of the Pennsylvania at Williamsport, Pa. He was appointed master mechanic at Sunbury, Pa., in July, 1917, and in May, 1918, was transferred to the Pittsburgh (Pa.) division. He was promoted to superintendent of motive power

of the Central Pennsylvania division at Williamsport, Pa., in December, 1919, and in June, 1924, was transferred to the Eastern Ohio division at Pittsburgh. From April to June, 1925, Mr. Bennett was general superintendent of motive power of the Southwestern region, at St. Louis, Mo., and in June, 1925, was transferred to the Eastern region at Philadelphia, in which position he remained until his present appointment.

SPECIAL

Philip V. D. Lockwood, advertising manager, New York Central System, with headquarters at New York, retired on January 31 under the company's pension rules. Mr. Lockwood was born on January 19, 1871, at New York, and entered railroad service in 1888 with the New York Central & Hudson River (now New York Central), serving until 1908 in various positions in the passenger traffic and advertising departments. From 1908 to 1920 he was advertising manager of the New York Central lines, becoming vice-president of the H. E. Lisan Advertising Agency, New York, in 1920. On April 15, 1929, Mr. Lockwood again became advertising manager of the New York Central.

OBITUARY

Harry E. Trout, vice-president and general superintendent of the Conemaugh & Black Lick, died on January 15.

Ralph H. Washburn, division engineer on the Alton at Bloomington, Ill., died on January 28.

John J. Mansfield, who retired about five years ago as chief boiler inspector of the Central of New Jersey, died on January 30.

Charles Harry Moore, who retired in April, 1931, as valuation engineer for the Erie at New York, died at his home in that city after an illness of two years, at the age of 77.

Col. Joseph White Williams, chief engineer of the Western Pacific, with headquarters at San Francisco, Cal., died at St. Joseph's hospital in that city on February 4, after an illness of two weeks.

Charles E. Green, former assistant to the vice-president of the Chicago, Rock Island & Pacific at Chicago, whose death at Humboldt, Iowa, on January 29, was announced in the *Railway Age* of February 1, was born in Wisconsin in 1867 and entered railway service in 1884 as a student telegrapher on the Chicago, Milwaukee, St. Paul & Pacific. In 1889 he went with the Burlington, Cedar Rapids & Northern (now part of the Rock Island) as an agent and operator, later being promoted successively to chief dispatcher, trainmaster, train rules examiner and superintendent of the Iowa and Missouri divisions. In 1930 Mr. Green was advanced to assistant to the vice-president in charge of operation at Chicago and later was appointed assistant general manager, the position he held until his retirement in 1937.

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Effectively...

INCREASE THEIR CAPACITY

This can be accomplished by the application of improved superheaters and feedwater heaters of either the pump or injector type. The resultant increased capacity will often make it possible for your older locomotives to be put back in main line service.

Our engineers are available for consultation in such a program.



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THE
SUPERHEATER
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Representative of
AMERICAN THROTTLE COMPANY, INC.
60 East 42nd Street, NEW YORK
122 S. Michigan Ave. CHICAGO

Montreal, Canada
THE SUPERHEATER COMPANY, LTD.

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF DECEMBER AND TWELVE MONTHS OF CALENDAR YEAR 1940

Name of road	Av. mileage operated during period	Operating revenues			Operating expenses			Operating ratio	Net from railway operation	Net railway operating income	
		Freight	Passenger	Total (inc. misc.)	Maintenance of way and structures	Equip-ment	Traffic			1940	1939
Akron, Canton & Youngstown.....	171	\$213,392	\$38	\$220,994	\$31,001	\$20,426	\$14,462	103.2	—\$7,115	\$16,322	\$38,525
Alton	171	2,292,535	398	2,388,573	338,297	247,335	170,358	69.5	558,209	413,297	306,009
Alton	959	1,054,877	251,079	1,547,632	141,308	281,292	47,388	73.2	728,751	168,601	191,607
Alton	959	11,552,373	2,555,294	16,474,713	2,482,608	2,782,600	559,706	81.0	3,134,655	2,033,248	920,648
Atchison, Topeka & Santa Fe System.....	13,408	12,354,346	1,701,596	15,844,924	1,762,093	3,096,567	503,589	73.0	4,283,764	3,431,666	1,800,923
Atlanta & West Point.....	13,413	136,534,632	18,492,634	170,003,639	24,338,628	35,841,738	5,740,724	76.3	23,187,362	24,017,625	19,170,866
Atlanta & West Point.....	93	125,700	30,651	185,053	17,411	27,299	95,114	76.2	44,060	696	—7,842
Atlanta & West Point.....	93	1,359,663	295,425	1,927,173	240,751	326,176	103,756	83.2	324,293	170,029	—18,900
Western of Alabama.....	133	115,455	30,803	169,128	16,263	31,285	8,306	77.0	38,929	20,170	2,147
Atlanta, Birmingham & Coast.....	133	1,341,480	294,080	1,845,005	226,616	358,715	98,051	81.1	349,489	155,595	136,880
Atlanta, Birmingham & Coast.....	639	286,224	14,997	319,795	47,525	67,522	25,983	93.9	19,635	26,114	43,030
Atlanta, Birmingham & Coast.....	639	2,983,872	227,312	3,455,361	567,522	643,746	287,352	91.2	305,752	29,440	—125,511
Atlantic Coast Line.....	5,099	3,878,952	683,657	5,111,857	343,800	836,666	190,846	69.1	1,580,276	1,084,973	406,824
Charleston & Western Carolina.....	5,101	37,069,217	7,863,738	50,087,984	5,162,193	10,118,662	2,018,750	79.0	10,520,475	3,757,234	3,781,872
Charleston & Western Carolina.....	343	213,839	2,372	221,128	34,210	28,645	9,580	68.7	69,104	56,503	24,443
Charleston & Western Carolina.....	343	2,512,100	20,218	2,586,763	379,258	464,489	111,940	72.2	718,158	453,158	428,680
Baltimore & Ohio.....	6,374	13,421,612	1,079,405	15,501,013	1,563,429	3,536,363	427,183	74.4	3,968,451	2,995,452	1,475,120
Baltimore & Ohio.....	6,381	158,106,838	10,619,307	179,175,465	17,769,083	40,233,128	4,969,512	74.0	46,374,666	34,928,971	25,525,100
Baltimore & Ohio.....	24	696,239	813,995	1,614,680	134,773	312,600	13,682	94.1	94,483	—211,191	—239,503
Bangor & Aroostook.....	603	405,616	18,746	444,004	51,339	57,002	5,490	59.0	182,120	129,045	114,485
Bessemer & Lake Erie.....	603	4,498,119	171,661	4,871,451	1,015,578	954,473	61,898	75.7	1,184,917	725,870	945,739
Bessemer & Lake Erie.....	224	910,981	7,743	924,248	48,480	334,931	11,828	70.8	270,263	160,945	216,956
Bessemer & Lake Erie.....	224	17,909,167	7,654	18,026,227	1,262,318	3,849,678	156,624	46.5	9,649,187	6,634,789	7,330,249
Boston & Maine.....	1,906	3,178,996	657,747	4,407,581	337,279	591,488	58,912	67.9	1,415,695	1,085,699	830,527
Burlington, Rock Island.....	1,910	34,523,393	7,072,015	47,597,792	5,802,585	7,078,677	772,145	72.0	13,339,801	9,678,747	6,935,242
Burlington, Rock Island.....	255	64,802	21,529	94,684	26,851	29,333	4,331	128.9	—27,398	—36,269	—42,476
Burlington, Rock Island.....	255	909,352	226,832	1,230,794	216,290	220,584	54,206	98.1	23,716	—93,236	—164,585
Cambria & Indiana.....	37	160,646	.....	160,758	—2,028	66,245	779	62.11	60,912	21,592	73,407
Canadian Pacific Lines in Maine.....	37	1,586,246	13,447	1,600,000	116,277	657,323	5,498	64.00	1,016,018	934,447	912,535
Canadian Pacific Lines in Maine.....	234	3,361,617	169,082	2,982,780	401,419	507,128	81,609	56.1	579,342	146,310	65,645
Canadian Pacific Lines in Maine.....	234	2,622,563	1,330,316	16,566,197	2,194,838	3,332,525	652,487	68.2	949,691	803,700	562,497
Canadian Pacific Lines in Vermont.....	91	70,783	5,346	86,068	10,961	21,099	1,974	128.7	—24,684	—30,151	—50,906
Central of Georgia.....	1,863	1,428,670	135,390	1,559,985	159,396	267,670	80,232	75.6	374,041	262,983	30,231
Central of Georgia.....	1,864	13,471,641	1,330,316	16,566,197	2,194,838	3,332,525	652,487	85.5	2,408,805	967,539	554,686
Central of New Jersey.....	711	2,776,452	357,291	3,334,779	253,766	743,376	44,725	72.1	930,904	504,618	301,791
Central Vermont	710	29,254,682	4,307,230	35,882,986	3,316,020	7,932,402	569,045	76.2	8,539,155	3,427,910	1,943,404
Central Vermont	422	496,290	33,458	572,631	83,423	68,586	4,604	72.5	157,433	135,666	172,451
Central Vermont	422	5,585,378	356,470	6,393,622	882,708	981,374	133,041	77.0	1,473,308	1,186,108	420,693
Chesapeake & Ohio.....	3,131	9,125,041	322,082	9,797,358	870,666	1,996,248	227,712	59.9	3,932,632	3,307,340	3,121,166
Chicago & Eastern Illinois.....	3,119	124,488,578	3,371,331	132,720,171	12,303,197	24,709,551	2,507,649	55.8	58,632,163	40,390,976	36,354,138
Chicago & Eastern Illinois.....	925	1,130,778	169,531	1,490,768	151,746	249,093	63,364	69.7	451,778	386,778	274,550
Chicago & Eastern Illinois.....	925	12,290,585	1,524,217	15,688,059	1,898,134	2,781,391	674,620	78.0	3,455,049	2,467,049	989,708
Chicago & Illinois Midland.....	131	451,300	646	478,328	36,836	72,177	17,961	52.4	227,447	201,137	113,859
Chicago & North Western	8,319	4,489,958	7,392	4,771,529	713,852	815,916	238,937	63.6	1,735,188	1,269,177	924,597
Chicago & North Western	8,324	5,961,282	1,126,643	8,089,851	1,005,488	1,403,997	192,004	74.2	2,089,814	1,744,868	284,569
Chicago & North Western	8,324	71,413,277	11,628,304	92,800,307	13,344,463	17,909,154	3,580,474	78.8	19,637,346	13,038,055	10,094,500
Chicago, Burlington & Quincy.....	8,958	7,278,336	804,774	9,146,236	1,064,678	1,719,756	234,689	73.0	2,464,997	2,603,206	1,910,430
Chicago Great Western.....	8,973	78,198,344	8,964,197	97,631,242	13,333,279	16,783,688	2,915,181	73.6	25,777,369	17,079,737	12,270,452
Chicago Great Western.....	1,502	1,656,968	50,647	1,839,418	191,834	184,468	58,687	60.2	732,672	578,129	367,860
Chicago Great Western.....	1,502	16,912,156	489,129	18,748,596	2,356,054	2,764,718	712,693	70.8	5,465,367	4,104,629	1,784,230
Chicago, Indianapolis & Louisville.....	549	751,472	39,800	869,364	57,793	120,709	26,990	57.5	369,561	334,854	104,822
Chicago, Indianapolis & Louisville.....	549	8,192,256	450,584	9,495,173	894,461	1,562,887	330,824	69.0	2,942,542	2,439,238	404,425

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF DECEMBER AND TWELVE MONTHS OF CALENDAR YEAR 1940—CONTINUED

Name of road	Av. mileage operated during period	Operating revenues				Maintenance of way and equipment				Traffic	Trans- portation	Total	Operating ratio	Net from railway operation	Net railway operating income	
		Freight	Passenger	(inc. misc.)	Total	Way and structures	Equip- ment	Other	Total						1940	1939
Chicago, Milwaukee, St. Paul & Pacific.....	10,854	\$8,401,712	\$9,111,716	\$10,328,490	\$1,029,319	\$1,812,685	\$265,855	\$3,771,725	\$7,293,608	265,855	3,771,725	\$7,293,608	70.6	\$3,034,882	\$2,234,882	\$1,883,057
Chicago, Rock Island & Pacific.....	10,874	9,513,461	8,100,381	11,437,589	17,989,750	20,560,370	2,774,772	41,292,352	87,170,144	2,774,772	41,292,352	87,170,144	76.2	27,205,445	18,485,445	13,845,644
Chicago, Rock Island & Pacific.....	7,900	5,303,599	895,934	6,912,690	17,989,750	20,560,370	2,774,772	41,292,352	87,170,144	2,774,772	41,292,352	87,170,144	72.5	1,903,178	1,553,521	1,232,835
Chicago, Rock Island & Pacific.....	7,895	65,260,004	8,271,251	80,701,923	11,208,952	14,582,286	3,150,548	29,935,653	62,391,445	3,150,548	29,935,653	62,391,445	77.3	18,310,478	12,742,248	8,133,477
Chicago, St. Paul, Minneapolis & Omaha.....	1,629	1,310,053	158,225	1,586,826	152,213	233,545	43,743	741,678	1,235,761	43,743	741,678	1,235,761	77.9	351,065	244,172	120,462
Clinchfield Railroad.....	1,629	15,015,729	1,584,827	18,078,966	2,518,556	3,065,501	475,519	8,097,848	14,952,323	475,519	8,097,848	14,952,323	82.7	31,266,643	17,544,539	406,869
Colorado & Southern.....	786	525,683	33,258	625,761	72,532	116,012	12,843	246,414	475,178	12,843	246,414	475,178	75.9	150,583	115,321	81,980
Fort Worth & Denver City.....	902	5,018,907	441,200	6,577,782	1,063,121	1,337,706	170,461	2,579,419	5,479,854	170,461	2,579,419	5,479,854	83.3	1,097,928	88,322	59,299
Columbus & Greenville.....	845	2,150,379	63,053	476,589	66,936	79,198	18,328	1,601,871	3,556,696	18,328	1,601,871	3,556,696	74.6	1,200,893	1,235,199	844,699
Delaware & Hudson.....	846	24,575,509	671,632	5,878,382	693,045	897,622	240,513	2,001,300	4,202,836	240,513	2,001,300	4,202,836	71.5	1,675,346	1,235,199	844,699
Delaware, Lackawanna & Western.....	995	3,405,808	582,068	4,505,707	223,291	697,974	111,947	1,981,748	3,168,395	111,947	1,981,748	3,168,395	70.3	1,337,312	880,088	857,647
Delaware & Rio Grande Western.....	995	39,923,784	6,337,113	51,891,975	3,700,281	9,624,445	1,336,183	23,006,800	39,424,078	1,336,183	23,006,800	39,424,078	76.0	12,467,897	7,119,573	6,736,558
Delaware & Rio Grande Western.....	2,553	23,443,076	1,500,084	26,219,195	3,238,368	5,921,034	967,999	9,342,399	20,478,871	967,999	9,342,399	20,478,871	78.1	5,740,324	3,494,279	2,761,157
Denver & Salt Lake.....	232	224,994	6,070	247,669	127,542	47,871	2,709	74,754	261,926	2,709	74,754	261,926	105.8	14,257	59,932	79,211
Detroit & Mackinac.....	242	53,373	2,581	64,835	8,537	13,301	31,914	732,648	1,782,129	31,914	732,648	1,782,129	75.4	581,122	377,929	911,293
Detroit & Toledo Shore Line.....	50	363,212	.....	364,330	18,410	20,220	9,114	89,679	145,394	9,114	89,679	145,394	39.9	218,936	152,110	85,947
Detroit, Toledo & Ironton.....	472	730,896	2,983	756,668	43,230	101,104	12,061	159,822	338,578	12,061	159,822	338,578	46.7	1,992,528	1,482,634	842,634
Duluth, Missabe & Iron Range.....	541	128,330	2,394	158,778	390,440	250,087	4,467	190,450	877,750	4,467	190,450	877,750	55.8	718,972	1,073,585	1,071,713
Duluth, Winnipeg & Pacific.....	175	165,740	1,153	171,563	19,379	234,186	23,423	602,706	1,199,567	23,423	602,706	1,199,567	78.0	338,381	217,825	55,140
Elgin, Joliet & Eastern.....	390	2,004,211	2	2,280,001	139,923	300,504	15,372	773,432	1,281,674	15,372	773,432	1,281,674	56.2	998,327	745,555	590,971
Erie.....	390	18,892,788	20,978	27,554,684	1,669,956	531,289	31,914	732,648	1,782,129	31,914	732,648	1,782,129	62.3	8,351,486	6,108,942	4,884,588
Florida East Coast.....	685	6,443,330	409,152	7,689,324	619,226	1,444,838	175,092	2,874,110	5,357,604	175,092	2,874,110	5,357,604	69.7	2,331,920	1,688,349	1,288,028
Georgia Railroad.....	329	317,048	17,613	369,865	31,077	683,129	19,044	1,737,209	3,226,607	19,044	1,737,209	3,226,607	78.9	860,825	676,302	744,358
Georgia & Florida.....	408	90,050	2,008	96,205	20,064	15,198	8,539	37,150	86,160	8,539	37,150	86,160	89.6	10,045	8,544	3,010
Grand Trunk Western.....	1,029	22,560,682	900,710	25,243,837	3,036,964	4,645,787	454,206	9,662,547	18,664,254	454,206	9,662,547	18,664,254	73.9	6,579,583	5,170,029	3,934,745
Canadian National Lines in New England.....	172	135,953	2,506	154,785	26,089	15,778	397	37,360	84,762	15,778	37,360	84,762	54.8	70,023	56,426	25,498
Great Northern.....	8,069	5,977,115	450,673	7,111,896	1,054,408	1,996,353	216,628	2,587,255	6,040,870	216,628	2,587,255	6,040,870	84.9	1,071,026	23,568,217	21,807,064
Green Bay & Western.....	234	1,692,649	6,433	1,769,111	33,172	198,045	86,082	591,063	1,258,372	86,082	591,063	1,258,372	71.1	510,734	318,441	247,011
Gulf & Ship Island.....	259	77,060	16,695	104,519	20,123	268,766	30,259	623,557	1,167,558	30,259	623,557	1,167,558	90.5	122,203	44,047	171,921
Gulf, Mobile & Ohio.....	1,973	1,447,934	58,069	1,578,957	201,007	337,088	89,339	511,526	1,130,977	89,339	511,526	1,130,977	71.6	447,980	240,980	154,296
Gulf, Mobile & Ohio.....	1,973	17,329,031	532,345	18,701,182	2,915,721	3,092,249	1,033,380	6,062,286	14,298,788	1,033,380	6,062,286	14,298,788	76.5	4,402,394	2,861,024	1,505,525

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70 Railroads and Heavy Industries

THE acid test of any development is its demonstrated adaptability, reliability and economy. Success is measured by growth. The rapid progress made by EMC Diesels as reflected in the ever increasing number of users is most significant. In six years over 480 EMC Switchers and 140 EMC units of road power have been placed in service by 70 railroads and industrial companies throughout the country.

What finer tribute to EMC Diesel leadership in reliability, economy, high availability, safety, increased passenger traffic and lower operating costs.



ELECTRO-MOTIVE
SUBSIDIARY OF GENERAL MOTORS



Complete Dieselization Most Economical

IN line with the established policy to pre-prove thoroughly each new type of equipment before offering it to the railroads, Electro-Motive Corporation built a 5400 hp. Diesel locomotive for test in freight service. This locomotive operated over 80,000 miles in actual service on 20 leading railroads from coast to coast, both as a 2700 hp. single unit and as a 5400 hp. double unit.

The marked increases in tonnage handled on existing schedules, the ability to shorten schedules and decrease the number of locomotives required, and other outstanding advantages and economies, proved conclusively that the EMC Diesel Freight Locomotive, in addition to EMC Diesels for switching, transfer and passenger service, now makes possible the complete Dieselization of any railroad.



ELECTRO-MOTIVE CORPORATION
 LA GRANGE, ILLINOIS, U. S. A.



REVENUES AND EXPENSES OF RAILWAYS

MONTH OF DECEMBER AND TWELVE MONTHS OF CALENDAR YEAR 1940—CONTINUED

Name of road	Av. mileage operated during period	Operating revenues			Operating expenses			Operating ratio	Net from railway operation	Net railway operating income			
		Freight	Passenger	Total (inc. misc.)	Way and structures	Equip-ment	Traffic			Trans- portation	Total	1940	1939
Illinois Central	4,949	\$7,183,939	\$1,035,598	\$8,899,885	\$840,160	\$1,403,587	\$216,751	\$3,272,365	\$6,060,220	68.1	\$2,839,665	\$2,352,416	\$1,934,482
Dec.	4,949	82,131,730	9,211,165	98,843,454	11,032,549	21,273,833	2,419,716	36,512,285	75,276,000	76.2	23,567,454	14,638,099	15,717,031
12 mos.	1,608	1,261,512	72,206	1,425,373	154,696	140,337	34,603	512,152	886,059	69.3	539,314	337,175	53,050
Yazoo & Mississippi Valley	1,609	13,784,262	731,844	15,422,956	1,462,315	2,271,778	377,439	6,020,566	10,690,279	62.3	4,332,677	2,121,051	2,096,097
Dec.	6,557	8,445,451	1,107,804	10,325,258	994,856	1,543,924	251,354	3,784,517	6,946,279	67.3	3,378,979	2,698,860	1,995,961
12 mos.	6,558	95,915,992	9,943,009	114,266,410	12,494,864	23,545,611	2,797,155	42,532,881	85,356,279	75.2	28,300,131	16,865,461	17,914,099
Illinois Terminal	477	388,267	67,528	505,271	67,087	67,706	16,984	171,926	152,650	69.8	152,650	106,404	129,636
Dec.	478	4,773,919	733,012	6,074,219	715,858	852,603	205,495	2,025,681	4,025,795	66.3	2,048,424	1,158,488	1,275,333
12 mos.	879	1,094,622	54,178	1,269,565	114,924	260,270	58,233	361,318	858,730	67.6	410,835	295,970	254,891
Kansas City Southern	879	12,607,919	425,284	14,382,380	1,281,836	2,148,163	677,315	4,165,819	8,971,669	62.4	5,410,311	3,420,043	3,157,032
Dec.	328	184,612	537	187,814	9,497	12,299	10,595	43,450	87,381	46.5	100,433	77,973	61,312
12 mos.	328	2,210,307	4,786	2,248,133	177,566	148,571	105,705	488,087	1,022,244	45.5	1,225,889	940,226	864,909
Lake Superior & Ishpeming	156	34,994	56	37,059	27,206	30,060	537	22,919	93,669	252.8	—56,610	—85,839	—83,234
Dec.	156	2,961,729	663	3,383,977	325,282	311,477	7,625	544,603	1,274,990	35.6	2,308,987	1,274,816	1,209,280
12 mos.	96	160,443	.....	161,295	13,896	25,810	3,636	49,830	99,076	61.4	62,219	30,951	14,882
Lehigh & Hudson River	96	1,719,462	.....	1,729,534	208,903	283,523	42,847	528,922	1,141,891	66.2	587,643	388,003	184,117
Dec.	190	359,185	.....	361,748	24,704	68,498	8,343	112,510	230,154	63.6	131,594	94,574	84,258
12 mos.	190	4,396,435	.....	4,427,029	371,238	762,388	84,024	1,377,658	2,779,451	62.8	1,647,578	1,147,569	1,235,324
Lehigh Valley	1,269	3,889,558	200,217	4,327,979	211,779	545,632	106,612	1,676,638	2,657,157	61.4	1,670,822	918,466	816,506
Dec.	1,275	42,644,526	2,054,090	47,479,837	3,165,959	7,769,754	1,281,435	19,520,585	33,223,586	70.0	14,256,251	9,498,081	6,883,261
12 mos.	897	699,289	21,406	754,183	107,152	152,012	31,260	250,476	584,011	77.4	170,172	238,108	129,398
Louisiana & Arkansas	867	7,870,018	134,247	8,320,858	1,335,174	1,152,760	359,108	2,250,530	5,427,453	65.2	2,893,405	2,322,196	1,731,127
Dec.	4,871	7,609,964	718,140	8,911,326	889,635	1,854,919	194,544	2,828,584	6,047,573	67.9	2,863,753	1,582,735	1,742,065
12 mos.	4,871	85,586,937	6,474,811	98,001,627	10,474,204	23,641,028	2,166,398	32,578,845	72,057,365	73.5	25,944,262	15,639,327	15,848,660
Maine Central	991	919,214	87,916	1,111,030	121,105	170,957	10,221	358,560	700,420	63.0	410,610	309,812	261,689
Dec.	991	10,116,438	932,918	12,157,074	1,793,410	2,165,794	135,521	4,341,902	8,845,060	72.8	3,312,014	2,305,391	1,966,206
12 mos.	352	110,033	55	112,295	4,140	6,868	2,889	33,982	56,533	50.3	55,762	37,384	34,030
Midland Valley	352	1,318,427	.....	1,341,403	160,197	114,916	31,076	374,608	753,449	56.2	587,955	454,318	398,230
Dec.	1,409	758,428	8,800	801,387	69,391	101,327	52,679	285,234	539,238	67.3	262,149	216,087	177,539
12 mos.	1,504	9,179,131	101,132	9,699,774	1,460,464	1,483,382	599,444	3,285,567	7,221,092	74.4	2,478,682	1,905,150	1,046,545
Minneapolis, St. Paul & Sault Ste. Marie	4,267	1,982,099	75,791	2,240,399	340,681	331,416	67,230	1,040,282	1,854,778	82.8	385,621	212,341	118,933
Dec.	4,277	27,784,922	940,197	30,975,218	4,668,310	4,614,711	762,512	11,961,316	23,057,408	74.4	7,917,810	5,677,026	2,826,813
12 mos.	550	156,999	9,695	182,290	23,998	45,338	6,295	104,763	187,003	102.6	—4,713	—18,984	17,163
Duluth, South Shore & Atlantic	550	2,405,692	90,145	2,630,309	518,455	431,023	79,444	1,008,932	2,115,437	80.7	504,872	330,301	83,087
Dec.	152	55,311	599	62,964	7,488	5,707	2,262	21,062	40,373	64.1	22,591	18,595	4,928
12 mos.	152	739,981	7,368	829,240	156,978	85,811	27,429	263,441	577,840	69.7	251,400	192,778	96,238
Mississippi Central	158	84,573	3,493	90,864	11,719	11,206	7,579	24,130	58,427	64.3	32,437	26,631	10,915
Dec.	151	787,210	23,532	842,225	229,715	120,146	88,788	248,014	741,593	88.1	100,632	41,417	—8,072
12 mos.	365	93,625	1,554	101,436	25,177	13,649	8,870	41,985	97,234	95.9	4,202	—1,642	—3,240
Missouri & Arkansas	365	1,105,518	17,224	1,201,742	296,693	135,531	89,281	388,346	979,108	81.5	222,634	156,585	40,212
Dec.	329	23,114,040	2,045,180	27,892,594	3,372,726	4,623,204	1,267,449	10,698,134	21,403,610	76.7	6,488,984	4,105,994	1,284,208
Missouri-Illinois	193	191,163	233	193,738	33,223	30,148	3,398	48,867	121,092	62.5	72,646	49,059	54,091
Dec.	193	2,205,965	3,698	2,238,527	291,517	266,946	37,834	591,889	1,255,931	56.1	982,596	634,801	474,791
12 mos.	3,293	1,896,503	221,262	2,406,314	252,792	340,031	110,116	908,092	1,714,177	71.2	492,137	498,072	113,766
Missouri-Kansas-Texas-Lines	3,293	23,114,040	2,045,180	27,892,594	3,372,726	4,623,204	1,267,449	10,698,134	21,403,610	76.7	6,488,984	4,105,994	1,284,208
Dec.	7,146	6,641,854	509,293	7,861,401	960,785	1,278,825	233,464	2,809,335	5,474,278	69.6	2,387,123	2,109,275	980,777
12 mos.	7,148	73,915,313	5,301,875	87,124,189	13,034,507	16,429,623	2,887,450	31,628,862	67,087,679	77.0	20,036,510	14,317,858	7,195,989
12 mos.	1,755	1,081,646	38,500	1,207,796	195,387	187,794	42,108	432,803	911,134	75.44	296,662	245,002	227,124
Gulf Coast Lines	1,757	13,320,420	447,861	14,556,843	2,352,533	2,168,693	530,495	4,725,237	10,400,758	71.45	4,156,085	3,268,421	2,467,863
Dec.	1,155	780,012	70,750	997,764	154,462	212,210	28,285	410,416	856,423	85.8	141,341	86,799	29,385
12 mos.	1,155	9,088,531	873,300	11,349,852	1,272,758	354,064	3,364,060	4,836,660	9,880,166	87.1	1,469,686	724,140	—20,259
Monongahela	172	350,769	594	352,936	26,964	33,611	497	86,835	151,153	42.8	201,783	154,064	138,817
Dec.	172	4,911,156	6,713	4,943,625	436,609	442,406	5,905	1,063,594	1,981,614	40.1	2,962,011	2,385,112	1,254,230
12 mos.	51	130,594	.....	132,455	8,953	30,706	743	39,033	86,560	65.4	45,895	27,315	52,126
Montour	51	2,202,795	.....	2,222,563	151,318	536,177	10,000	525,208	1,306,828	58.8	915,735	875,040	843,516

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF DECEMBER AND TWELVE MONTHS OF CALENDAR YEAR 1940—CONTINUED

Name of road	Av. mileage operated during period	Operating revenues			Maintenance of		Operating expenses		Operating ratio	Total	Trans- portation	Operating income	
		Freight	Passenger	(inc. misc.)	Way and structures	Equip- ment	Traffic						1940	1939
Nashville, Chattanooga & St. Louis.....	1,111	\$1,234,040	\$152,004	\$1,552,600	\$84,420	\$198,005	\$74,191	\$570,095	\$985,261	63.5	\$567,339	\$419,161	\$60,354
	1,111	12,906,131	1,163,813	15,632,633	1,647,455	2,912,028	805,910	6,117,644	12,149,893	77.7	3,482,740	2,382,369	1,982,653
	1,111	59,525	1,163,813	65,573	12,875	4,537	1,184	11,788	37,214	56.8	28,359	8,826	30,305
	165	681,723	9,110	746,404	103,515	34,697	14,938	125,997	342,443	45.9	403,961	214,789	225,509
Nevada Northern	165												
	10,984	24,995,689	6,141,103	34,854,494	3,528,140	7,794,654	529,550	12,825,413	25,986,976	74.6	8,867,518	8,213,367	4,614,358
	10,987	270,274,028	59,322,145	370,545,875	39,454,595	77,989,733	6,596,590	139,498,310	278,674,980	75.2	91,870,895	58,394,876	44,032,437
	233	1,956,344	49,447	2,068,342	160,479	595,038	47,321	611,328	1,495,225	72.3	572,917	258,680	535,222
	233	22,803,883	485,645	23,947,038	1,905,186	8,177,941	357,232	6,846,949	18,231,615	76.1	5,715,423	2,630,434	5,591,525
Pittsburgh & Lake Erie.....	1,704	4,123,136	67,582	4,316,381	364,999	606,118	122,326	1,428,583	2,654,152	61.5	1,662,229	1,356,608	983,601
	1,704	44,249,825	810,033	46,423,402	4,685,586	7,339,815	1,455,298	16,517,913	31,111,419	67.0	15,311,983	12,107,415	8,492,405
	1,853	780,946	2,478,712	8,091,190	744,664	1,177,416	121,380	2,913,850	5,229,181	65.5	2,794,009	2,230,914	1,240,356
	1,864	50,512,702	26,342,490	85,604,109	10,597,580	13,517,769	1,365,730	32,187,263	62,199,236	72.7	23,404,873	16,797,219	8,462,922
New York, New Haven & Hartford.....	1,704	4,123,136	67,582	4,316,381	364,999	606,118	122,326	1,428,583	2,654,152	61.5	1,662,229	1,356,608	983,601
	1,704	44,249,825	810,033	46,423,402	4,685,586	7,339,815	1,455,298	16,517,913	31,111,419	67.0	15,311,983	12,107,415	8,492,405
	1,853	780,946	2,478,712	8,091,190	744,664	1,177,416	121,380	2,913,850	5,229,181	65.5	2,794,009	2,230,914	1,240,356
	1,864	50,512,702	26,342,490	85,604,109	10,597,580	13,517,769	1,365,730	32,187,263	62,199,236	72.7	23,404,873	16,797,219	8,462,922
New York, New Haven & Hartford.....	1,704	4,123,136	67,582	4,316,381	364,999	606,118	122,326	1,428,583	2,654,152	61.5	1,662,229	1,356,608	983,601
	1,704	44,249,825	810,033	46,423,402	4,685,586	7,339,815	1,455,298	16,517,913	31,111,419	67.0	15,311,983	12,107,415	8,492,405
	1,853	780,946	2,478,712	8,091,190	744,664	1,177,416	121,380	2,913,850	5,229,181	65.5	2,794,009	2,230,914	1,240,356
	1,864	50,512,702	26,342,490	85,604,109	10,597,580	13,517,769	1,365,730	32,187,263	62,199,236	72.7	23,404,873	16,797,219	8,462,922
New York, New Haven & Hartford.....	1,704	4,123,136	67,582	4,316,381	364,999	606,118	122,326	1,428,583	2,654,152	61.5	1,662,229	1,356,608	983,601
	1,704	44,249,825	810,033	46,423,402	4,685,586	7,339,815	1,455,298	16,517,913	31,111,419	67.0	15,311,983	12,107,415	8,492,405
	1,853	780,946	2,478,712	8,091,190	744,664	1,177,416	121,380	2,913,850	5,229,181	65.5	2,794,009	2,230,914	1,240,356
	1,864	50,512,702	26,342,490	85,604,109	10,597,580	13,517,769	1,365,730	32,187,263	62,199,236	72.7	23,404,873	16,797,219	8,462,922
New York, New Haven & Hartford.....	1,704	4,123,136	67,582	4,316,381	364,999	606,118	122,326	1,428,583	2,654,152	61.5	1,662,229	1,356,608	983,601
	1,704	44,249,825	810,033	46,423,402	4,685,586	7,339,815	1,455,298	16,517,913	31,111,419	67.0	15,311,983	12,107,415	8,492,405
	1,853	780,946	2,478,712	8,091,190	744,664	1,177,416	121,380	2,913,850	5,229,181	65.5	2,794,009	2,230,914	1,240,356
	1,864	50,512,702	26,342,490	85,604,109	10,597,580	13,517,769	1,365,730	32,187,263	62,199,236	72.7	23,404,873	16,797,219	8,462,922
New York, New Haven & Hartford.....	1,704	4,123,136	67,582	4,316,381	364,999	606,118	122,326	1,428,583	2,654,152	61.5	1,662,229	1,356,608	983,601
	1,704	44,249,825	810,033	46,423,402	4,685,586	7,339,815	1,455,298	16,517,913	31,111,419	67.0	15,311,983	12,107,415	8,492,405
	1,853	780,946	2,478,712	8,091,190	744,664	1,177,416	121,380	2,913,850	5,229,181	65.5	2,794,009	2,230,914	1,240,356
	1,864	50,512,702	26,342,490	85,604,109	10,597,580	13,517,769	1,365,730	32,187,263	62,199,236	72.7	23,404,873	16,797,219	8,462,922
New York, New Haven & Hartford.....	1,704	4,123,136	67,582	4,316,381	364,999	606,118	122,326	1,428,583	2,654,152	61.5	1,662,229	1,356,608	983,601
	1,704	44,249,825	810,033	46,423,402	4,685,586	7,339,815	1,455,298	16,517,913	31,111,419	67.0	15,311,983	12,107,415	8,492,405
	1,853	780,946	2,478,712	8,091,190	744,664	1,177,416	121,380	2,913,850	5,229,181	65.5	2,794,009	2,230,914	1,240,356
	1,864	50,512,702	26,342,490	85,604,109	10,597,580	13,517,769	1,365,730	32,187,263	62,199,236	72.7	23,404,873	16,797,219	8,462,922
New York, New Haven & Hartford.....	1,704	4,123,136	67,582	4,316,381	364,999	606,118	122,326	1,428,583	2,654,152	61.5	1,662,229	1,356,608	983,601
	1,704	44,249,825	810,033	46,423,402	4,685,586	7,339,815	1,455,298	16,517,913	31,111,419	67.0	15,311,983	12,107,415	8,492,405
	1,853	780,946	2,478,712	8,091,190	744,664	1,177,416	121,380	2,913,850	5,229,181	65.5	2,794,009	2,230,914	1,240,356
	1,864	50,512,702	26,342,490	85,604,109	10,597,580	13,517,769	1,365,730	32,187,263	62,199,236	72.7	23,404,873	16,797,219	8,462,922
New York, New Haven & Hartford.....	1,704	4,123,136	67,582	4,316,381	364,999	606,118	122,326	1,428,583	2,654,152	61.5	1,662,229	1,356,608	983,601
	1,704	44,249,825	810,033	46,423,402	4,685,586	7,339,815	1,455,298	16,517,913	31,111,419	67.0	15,311,983	12,107,415	8,492,405
	1,853	780,946	2,478,712	8,091,190	744,664	1,177,416	121,380	2,913,850	5,229,181	65.5	2,794,009	2,230,914	1,240,356
	1,864	50,512,702	26,342,490	85,604,109	10,597,580	13,517,769	1,365,730	32,187,263	62,199,236	72.7	23,404,873	16,797,219	8,462,922
New York, New Haven & Hartford.....	1,704	4,123,136	67,582	4,316,381	364,999	606,118	122,326	1,428,583	2,654,152	61.5	1,662,229	1,356,608	983,601
	1,704	44,249,825	810,033	46,423,402	4,685,586	7,339,815	1,455,298	16,517,913	31,111,419	67.0	15,311,983	12,107,415	8,492,405
	1,853	780,946	2,478,712	8,091,190	744,664	1,177,416	121,380	2,913,850	5,229,181	65.5	2,794,009	2,230,914	1,240,356
	1,864	50,512,702	26,342,490	85,604,109	10,597,580	13,517,769	1,365,730	32,187,263	62,199,236	72.7	23,404,873	16,797,219	8,462,922
New York, New Haven & Hartford.....	1,704	4,123,136	67,582	4,316,381	364,999	606,118	122,326	1,428,583	2,654,152	61.5	1,662,229	1,356,608	983,601
	1,704	44,249,825	810,033	46,423,402	4,685,586	7,339,815	1,455,298	16,517,913	31,111,419	67.0	15,311,983	12,107,415	8,492,405
	1,853	780,946	2,478,712	8,091,190	744,664	1,177,416	121,380	2,913,850	5,229,181	65.5	2,794,009	2,230,914	1,240,356
	1,864	50,512,702	26,342,490	85,604,109	10,597,580	13,517,769	1,365,730	32,187,263	62,199,236	72.7	23,404,873	16,797,219	8,462,922
New York, New Haven & Hartford.....	1,704	4,123,136	67,582	4,316,381	364,999	606,118	122,326	1,428,583	2,654,152	61.5	1,662,229	1,356,608	983,601
	1,704	44,249,825	810,033	46,423,402	4,685,586	7,339,815	1,455,298	16,517,913	31,111,419	67.0	15,311,983	12,107,415	8,492,405
	1,853	780,946	2,47										

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF DECEMBER AND TWELVE MONTHS OF CALENDAR YEAR 1940—CONTINUED

Name of road	Av. mileage operated during period	Operating revenues			Operating expenses			Operating ratio	Net from railway operation	Net railway operating income					
		Freight	Passenger	Total (inc. misc.)	Traffic	Trans- portation	Total			Operating income	1940	1939			
Seaboard Air Line.....	Dec.	4,310	\$3,765,925	\$846,170	\$5,128,516	\$418,958	\$919,514	\$201,660	\$1,811,803	\$3,623,357	70.7	\$1,505,159	\$1,218,212	\$1,024,192	\$910,900
.....	12 mos.	4,314	36,492,487	7,526,443	48,490,966	6,813,695	9,627,440	2,142,440	18,077,829	39,270,764	81.0	9,220,202	4,404,333	3,594,371	3,594,371
Southern Railway	Dec.	6,584	987,575	1,093,123	9,930,415	681,986	1,606,626	3,164,359	3,283,210	6,059,465	61.0	3,870,950	3,181,634	2,883,299	2,364,311
.....	12 mos.	6,594	88,591,660	9,177,690	105,905,395	13,081,071	18,001,667	1,973,744	35,868,238	72,870,181	68.8	33,035,214	24,643,732	21,457,294	20,631,130
Alabama Great Southern.....	Dec.	315	591,665	85,355	730,992	17,063	167,261	14,671	207,202	428,168	58.6	302,824	177,805	181,263	162,223
.....	12 mos.	315	7,048,233	654,159	8,225,000	984,847	1,700,030	167,411	2,346,980	5,478,497	66.6	2,746,503	1,673,258	1,697,157	1,768,249
Cincinnati, New Orleans & Texas Pacific.....	Dec.	337	1,384,209	171,384	1,669,727	65,211	335,228	30,303	420,645	904,512	54.2	765,215	584,857	590,682	565,476
.....	12 mos.	337	16,023,191	1,268,542	18,320,382	1,988,165	3,589,726	360,606	4,661,734	11,252,494	61.4	7,067,888	4,840,888	4,998,100	5,185,059
Georgia Southern & Florida.....	Dec.	398	269,742	68,459	417,982	13,975	39,227	2,134	147,997	212,319	50.8	205,663	206,131	175,660	69,646
.....	12 mos.	398	2,147,640	486,075	2,982,334	408,979	456,899	23,493	1,130,452	2,117,782	71.0	864,552	677,723	494,382	118,778
New Orleans & Northeastern.....	Dec.	204	266,557	35,162	327,701	7,836	32,694	6,114	79,944	139,480	42.6	188,221	187,673	161,946	64,475
.....	12 mos.	204	2,886,305	239,788	3,359,932	420,474	420,162	71,788	951,820	2,014,553	60.0	1,345,379	957,011	675,770	503,713
Southern Pacific	Dec.	8,607	13,213,131	1,935,963	16,552,272	1,499,827	2,433,273	351,188	6,180,105	11,282,278	68.2	5,269,994	4,233,918	3,444,551	1,965,076
.....	12 mos.	8,630	142,533,060	20,499,502	177,117,783	17,539,915	29,720,768	4,436,690	65,031,421	126,679,829	71.5	50,437,954	36,484,629	26,751,574	23,115,495
Southern Pacific Steamship Lines.....	Dec.	.....	737,160	8,255	780,360	27,140	293,643	15,569	616,508	965,011	123.7	184,651	213,116	214,197	228,5
.....	12 mos.	.....	8,367,473	372,257	9,154,459	253,054	1,454,483	221,410	6,673,267	8,763,131	95.7	391,328	87,707	77,020	139,497
Texas & New Orleans.....	Dec.	4,417	3,362,910	355,606	4,151,776	407,561	680,455	131,113	1,315,471	2,732,338	65.8	1,419,438	1,170,969	1,177,659	627,781
.....	12 mos.	4,417	38,312,616	3,608,362	45,660,037	6,715,780	7,760,834	1,493,253	15,421,303	33,825,751	74.1	11,834,286	8,233,187	5,637,265	5,173,418
Spokane, Portland & Seattle.....	Dec.	948	777,251	32,191	875,932	150,826	88,887	11,518	291,246	570,537	65.1	305,395	231,185	148,941	97,506
.....	12 mos.	948	8,614,313	386,457	9,718,807	2,014,898	1,026,890	129,781	3,270,134	6,786,882	69.8	2,931,925	2,021,759	1,282,076	821,023
Tennessee Central	Dec.	286	195,489	4,860	217,096	7,058	29,620	7,372	78,493	131,284	60.5	85,812	63,196	46,907	57,811
.....	12 mos.	286	2,366,997	56,437	2,589,413	440,632	397,795	84,749	893,209	1,933,930	74.7	655,483	485,243	310,615	298,841
Texas & Pacific	Dec.	1,887	1,845,038	228,249	2,320,125	247,109	514,380	73,237	721,011	1,670,211	72.0	749,914	463,621	442,778	378,920
.....	12 mos.	1,903	21,748,450	2,314,786	26,496,558	3,076,790	5,050,241	894,112	8,400,395	18,779,929	70.9	7,716,629	5,848,154	4,875,692	4,365,221
Texas Mexican	Dec.	162	68,640	241	81,557	17,317	18,137	3,541	33,338	80,769	99.0	788	—4,882	7,899	3,473
.....	12 mos.	162	813,675	3,593	974,774	155,662	129,599	37,960	380,156	778,990	79.9	195,784	124,732	85,889	82,469
Toledo, Peoria & Western.....	Dec.	239	190,397	1	192,910	65,698	15,551	19,793	44,915	161,781	83.9	31,129	35,693	18,227	117,843
.....	12 mos.	239	2,336,534	79	2,373,260	487,754	180,039	213,765	537,677	1,573,619	66.3	799,641	524,435	329,802	442,984
Union Pacific System.....	Dec.	9,892	12,407,033	1,697,180	15,661,898	814,708	2,641,168	360,025	5,405,192	9,885,387	63.1	5,776,511	4,546,639	3,865,090	3,164,996
.....	12 mos.	9,901	136,464,742	17,472,731	168,164,258	17,671,260	32,718,371	4,829,001	56,868,021	120,949,111	71.9	47,215,147	32,521,758	23,358,960	20,233,188
Utah	Dec.	111	96,427	.....	6,380	25,195	402	402	26,543	62,729	64.9	33,978	20,768	25,884	23,348
.....	12 mos.	111	862,652	.....	864,351	108,565	295,266	5,180	235,869	695,963	80.5	168,388	51,184	80,380	61,624
Virginian	Dec.	653	2,174,591	3,301	2,238,810	190,883	331,507	22,950	311,515	1,114,946	49.8	1,123,864	808,864	885,355	947,093
.....	12 mos.	640	24,986,051	35,412	25,645,904	2,446,816	4,643,613	292,984	3,676,434	11,646,440	45.4	13,999,464	9,009,464	9,675,197	9,028,510
Wabash	Dec.	2,409	3,554,816	239,005	4,111,690	384,867	631,063	149,779	1,574,073	2,780,131	67.6	1,331,559	1,184,901	872,565	645,945
.....	12 mos.	2,409	40,240,153	2,417,511	46,013,670	5,978,310	7,266,157	1,787,118	17,953,014	34,705,545	75.4	11,308,125	8,569,534	4,553,345	3,559,246
Ann Arbor	Dec.	294	346,883	3,069	358,239	22,534	42,949	13,866	159,885	243,280	67.9	114,959	91,053	79,061	30,539
.....	12 mos.	294	3,974,900	32,423	4,141,145	376,058	797,318	162,533	1,773,589	3,248,881	78.5	892,264	609,221	450,291	368,563
Western Maryland	Dec.	861	1,760,574	6,472	1,836,687	176,100	365,222	40,142	449,422	1,083,320	69.0	753,367	564,397	564,490	622,148
.....	12 mos.	860	18,403,567	81,711	19,146,204	2,385,407	4,002,212	478,063	4,879,153	12,338,781	64.4	6,807,423	5,258,453	5,306,408	4,775,969
Western Pacific	Dec.	1,195	1,636,254	64,314	1,734,238	141,349	231,771	61,853	646,168	1,137,583	65.6	596,655	514,539	400,867	128,833
.....	12 mos.	1,205	17,518,771	612,800	18,489,801	2,675,023	2,643,466	746,651	6,738,441	13,644,105	73.8	4,845,696	3,806,718	2,646,400	1,674,540
Wheeling & Lake Erie.....	Dec.	507	1,278,773	.....	1,332,861	142,295	317,052	46,617	382,402	959,280	72.0	373,581	154,760	269,959	374,540
.....	12 mos.	507	16,120,883	.....	16,997,566	2,047,742	3,393,079	463,364	4,956,971	11,304,166	66.5	5,693,400	3,220,732	4,344,733	4,083,761